MONTANA FISH, WILDLIFE & PARKS
FISHERIES BUREAU

Environmental Assessment of Westslope Cutthroat Trout Restoration in North Fork Spanish Creek Gallatin River Drainage

PART I: PROPOSED ACTION DESCRIPTION

A. Type of Proposed Action: Montana Fish Wildlife and Parks (FWP) and the Custer-Gallatin National Forest are proposing to restore Westslope Cutthroat Trout (WCT) to North Fork Spanish Creek upstream of a constructed fish barrier located on private land. Native WCT would be restored to 17 miles of upper North Fork Spanish Creek – a tributary to the Gallatin River. WCT would also be restored to two high mountain lakes within the North Fork Spanish Creek basin – Chiquita and Big Brother lakes. Construction of a fish barrier and removal of non-native Brook Trout, Rainbow Trout, and Yellowstone Cutthroat Trout with rotenone, an EPA registered piscicide, would more than double the number of WCT occupied miles of stream in the Gallatin River drainage. WCT necessary for recolonization would be sourced from the last three existing populations in the Gallatin River drainage or from appropriate local populations in other drainages.

B. Agency Authority for the Proposed Action:

FWP is required by law (§87-1-201(9)(a) Montana Code Annotated [MCA]) to implement programs that manage sensitive fish species in a manner that assists in the maintenance or recovery of those species, and that prevents the need to list the species under § 87-5-107 MCA or the federal Endangered Species Act. Section 87-1-201(9)(a), M.C.A.

FWP is a signatory to the Memorandum of Understanding and Conservation Agreement for WCT in Montana (FWP 1999, 2007) which states: "The management goal for WCT in Montana is to ensure the long-term, self-sustaining persistence of the subspecies within each of the five major river drainages they historically inhabited in Montana, and to maintain genetic diversity and life history strategies represented by the remaining local populations."

According the FWP Statewide Fisheries Management Plan, the restoration goal for WCT east of the Continental Divide (Upper Missouri River Basin upstream from and including the Judith River) is to restore secure conservation populations of WCT to 20% of their historic distribution (FWP 2012). Populations of WCT are considered secure by FWP when they are isolated from non-native fishes, typically by a physical fish passage barrier, have a population size of at least 2,500 fish, and occupy sufficient (5 to 6 miles) habitat to assure long-term persistence. Currently WCT (including slightly hybridized populations > 90% WCT) occupy approximately 8% of their historic habitat range-wide.

The use of chemicals in wilderness areas requires prior approval by the federal administering agency. Forest Service policy (FSM 2320) states that chemical treatment may be necessary to prepare waters for the reestablishment of indigenous fish species, consistent with approved wilderness management plans, to conserve or recover federally listed threatened or endangered species, or to correct undesirable conditions resulting from human activity. Forest Service can authorize the use of piscicide in designated wilderness by using the effects analysis disclosed in this EA and the application of the Forest Service's Minimum Requirements Decision Guide (MRDG) as outlined in Section E., General Policy (Association of Wildlife and Fish Agencies 2006).

The draft decision will be subject to the Forest Service's objection process pursuant to 36 CFR 218, subparts A and B. Objections can only be made regarding that portion of the overall project that the Forest Service has authority to approve. Objections will only be accepted from those who have previously submitted specific written comments regarding the proposed project during scoping or other designated opportunity for public comment in accordance with § 218.5(a). Issues raised in objections must be based on previously submitted timely, specific written comments regarding the proposed project unless based on new information arising after the designated comment opportunities.

Proposals to use prohibitive actions or tools in accordance with the Wilderness Act are considered and may also be authorized by the federal administering agency through the application of the MRDG process. Prohibitive actions associated with the proposed action: use of motorized and mechanized equipment, application of chemicals and pesticides, and gill nets.

Sensitive fish and wildlife species on National Forest System Lands are managed under the authority of the National Forest Management Act (NFMA), and are administratively designated by the Regional Forester (FSM 2670.5; USFS 2004). The project area is included in Forest Service Region 1 on the Custer Gallatin National Forest. FSM 2670.22 requires the maintenance of viable populations of native and desired nonnative species and to avoid actions that may cause a species to become threatened or endangered. The NFMA directs the Forest Service to "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives." [16 U.S.C. 1604(g)(3)(B)]. Providing ecological conditions to support diversity of native plant and animal species in the project area satisfies the statutory requirements. The Forest Service's focus for meeting the requirements of NFMA and its implementing regulations is on assessing habitat to provide for a diversity of species.

FSM 2672.42 directs the Forest Service to conduct a Biological Evaluation (BE) to analyze and disclose potential impacts on sensitive species. If any unmitigated, significant effects are identified in the BE, the deciding officer must make a decision to allow or disallow the impact. If the significant effects would result in a trend toward federal listing, the deciding officer cannot allow the project to proceed. The Forest Service's decision authority with respect to this project is limited to the use of pesticides in wilderness. The analysis for sensitive aquatic species in this document is intended to inform the decision maker whether to allow pesticide use in the Lee Metcalf Wilderness Area and meets the requirements for a BE as outlined in FSM 2672.42. A

separate standalone BE that discloses potential effects to sensitive terrestrial fish and wildlife species is included in the project record. See Table 1 for a list of sensitive species.

Under Section 7 of the ESA, each federal agency must ensure that any action authorized, funded or carried out is not likely to jeopardize the continued existence of any threatened or endangered species and critical habitat (Table 1). The separate standalone BA disclosing potential effects to threatened and endangered species and designated critical habitat is included in the project file.

Table 1: Species of special concern, sensitive, and threatened species with ranges overlapping the project area.

Class	***Class Common***	***Scientific Name***	***FWP Status***	***U.S. Forest Service Status***
Amphibia	Western toad	*Anaxyrus boreas*	S2	Sensitive
	Northern leopard frog	*Rana pipiens*	S4	Sensitive
	Plains spadefoot	*Spea bombifrons*	S3	Sensitive
Bivalvia or Mollusks	Western pearlshell mussel	*Margaritifera falcata*	S2	Sensitive
Fish	Westslope Cutthroat Trout	*Oncorhynchus clarkii lewisi*		Sensitive
Aves	Harlequin duck	*Histrionicus histrionicus*	S2B	Sensitive
	Bald eagle	*Haliaeetus leucocephalus*	S3	Sensitive
	American peregrine falcon	*Falco pergrinus anatum*	S3	Sensitive
	Black-backed woodpecker	*Picoides arcticus*	S3	Sensitive
	Flammulated owl	*Otus flammeolus*	S3B	Sensitive
	Trumpeter swan	*Cygnus buccinator*	S3	Sensitive
Mammalia	Townsend's big-eared bat	*Corynorhinus townsendii*	S2	Sensitive
	Grizzly bear	*Ursus arctos*	S2S3	Threatened
	Gray wolf	*Canis lupis*	S4	Sensitive
	Bighorn sheep	*Ovis canadensis*	S4	Sensitive
	North American wolverine	*Gulo gulo luscus*	S3	Proposed
	Lynx	*Lynx canadensis*	S3	Threatened
	Lynx	*Lynx canadensis*	S3	Critical Habitat

Definitions of Status Codes and Descriptors
S2 = At risk because of very limited and/or potentially declining population numbers, range and/or habitat, making it vulnerable to global extinction or extirpation in the state.
S3= Potentially at risk because of limited and/or declining numbers, range and/or habitat, even though it may be abundant in some areas.
S2B = An at risk breeding population, with an S2 ranking
S2S3 = Indicates that populations in different geographic portions of the species' range in Montana have a different conservation status *(e.g., S1 west of the Continental Divide and S4 east of the Continental Divide).*
Sensitive = Listed as a sensitive species USFS regions 1 and 2.
Threatened = Listed as threatened under the U.S. Endangered Species Act

C. Estimated Commencement Date: August to early September 2017.

D. Name and Location of the Project: Westslope Cutthroat Trout Restoration in North Fork Spanish Creek in the Gallatin River Drainage.

North Fork Spanish Creek and its tributaries (Willow Swamp, Camp Creek, Chiquita Lake and Big Brother Lake) are situated on the northeastern portion of the Lee Metcalf Wilderness Area (≈ 75%) and on private land (≈ 25%). North Fork Spanish Creek originates at approximately 45.3977°N, 111.4975°W, at 9,000 ft. The proposed fish barrier location and elevation is 45.4682°N, 111.4099°W, at 6,400 ft. (Figure 1).

E. Project Size (acres affected):

Developed/residential – 0 acres
Industrial – 0 acres
Open space/Woodlands/Recreation – 0 acres
Wetlands/Riparian – Habitable stream miles in the proposed action include approximately 8 miles of North Fork Spanish Creek, 4 miles of Camp Creek, 4 miles of Willow Swamp Creek, 0.25 miles of Placer Creek, 1 mile of Alder Creek for a total of roughly 17 miles. Chiquita Lake is approximately 3.5 surface acres and Big Brother Lake is approximately 5 surface acres. Other stream reaches and lakes in the basin are fishless.
Floodplain – 0 acres
Irrigated Cropland – 0 acres
Dry Cropland – 0 acres
Forestry – 0 acres
Rangeland – 0 acres

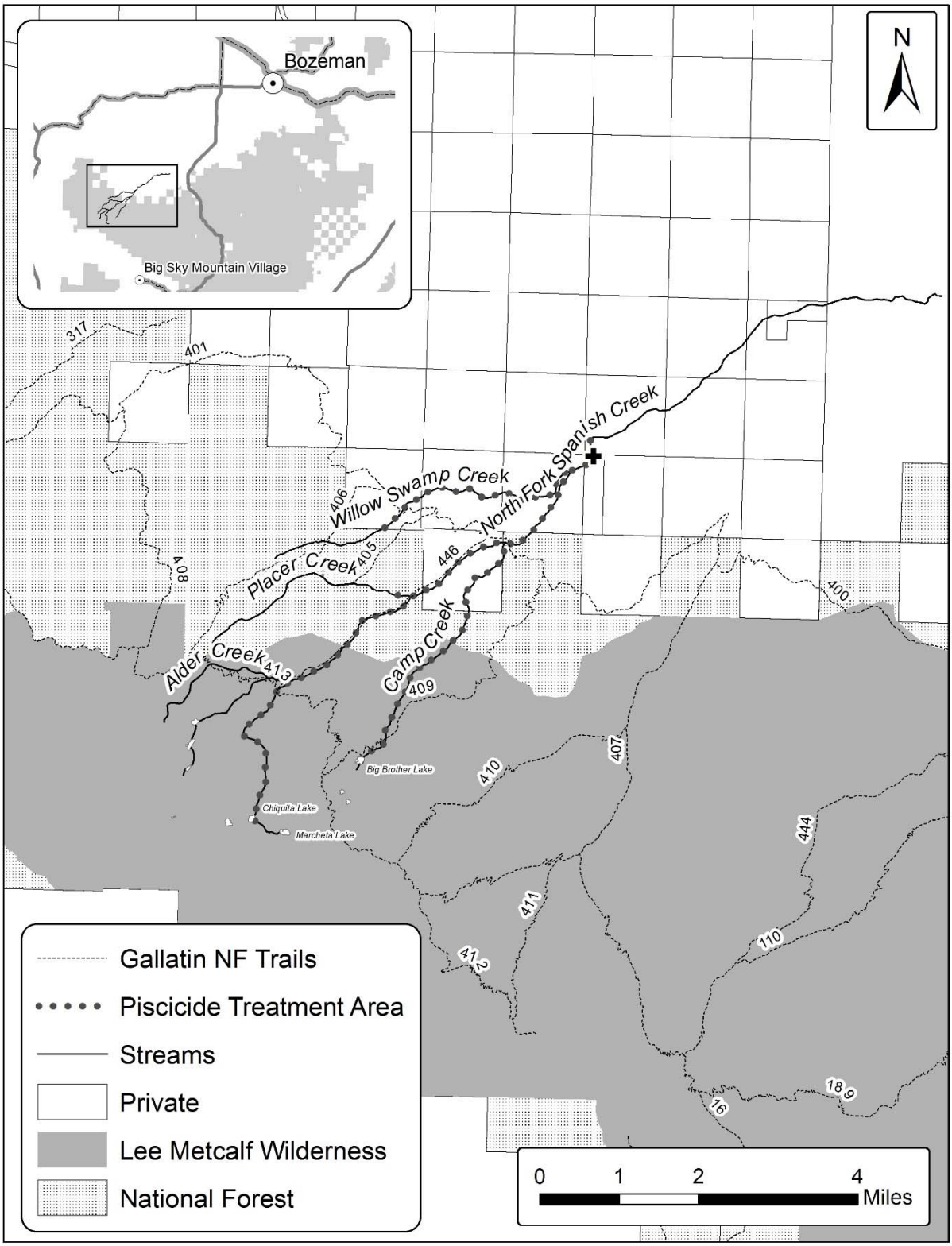

Figure 1. North Fork Spanish Creek project location, land ownership, and access.

F. Narrative Summary of the Proposed Action and Purpose of the Proposed Action

Background

The Cutthroat Trout is Montana's state fish. Westslope Cutthroat Trout *Oncorhynchus clarkii lewisi* (WCT) were first described by the Lewis and Clark Expedition in 1805 near Great Falls, Montana, and are recognized as one of 14 interior subspecies of Cutthroat Trout. The historical range of WCT includes Idaho, Montana, Washington, Wyoming, and Alberta, Canada. In Montana, WCT occupy the upper Missouri and Saskatchewan River drainages east of the Continental Divide, and the upper Columbia Basin west of the Divide. Although still widespread, WCT distribution and abundance in Montana has declined significantly in the past 100 years due to a variety of causes including introductions of nonnative fish, habitat degradation, and over-exploitation (Hanzel 1959, Liknes 1984, McIntyre and Rieman 1995, Shepard et al. 1997, Shepard et al. 2003). Reduced distribution of WCT is particularly evident in the Missouri River drainage where genetically unaltered WCT are estimated to persist in less than 4% of the habitat they once occupied, and most remaining populations are restricted to isolated headwater habitats (Shepard et al. 2003; Shepard et al. 2005). Further, many of these remaining populations are at risk of extinction due to small population size and the threats of competition, predation, and hybridization with non-native trout species.

The declining status of WCT has led to its designation as a *Species of Special Concern* by the State of Montana, a *Sensitive Species* by the U.S. Forest Service (USFS), and a *Special Status Species* by the Bureau of Land Management (BLM). In addition, in 1997 a petition was submitted to the U.S. Fish and Wildlife Service (USFWS) to list WCT as "threatened" under the *Endangered Species Act* (ESA). USFWS status reviews have found that WCT are "not warranted" for ESA listing (DOI 2003); however, this finding was in litigation until 2008 and additional efforts to list WCT under ESA are still possible.

In an effort to advance range-wide WCT conservation efforts in Montana, a Memorandum of Understanding and Conservation Agreement for WTC in Montana was developed in 1999 by several federal and state resource agencies (including the BLM, FWP, the USFS, and Yellowstone National Park [YNP]), non-governmental conservation and industry organizations, tribes, resource users, and private landowners (FWP 1999: MOU). The MOU outlined goals and objectives for WCT conservation in Montana, which if met, would significantly reduce the need for special status designations and listing of WCT under the ESA. The MOU was revised and endorsed by signatories in 2007 (FWP 2007). As outlined in these MOU's, *the primary management goal for WCT in Montana is to ensure the long-term self-sustaining persistence of the subspecies in its historical range*. This goal can be achieved by maintaining, protecting, and enhancing all designated WCT "conservation" populations, and by reintroducing WCT to habitats where they have been extirpated.

Non-hybridized WCT are currently found in less than 4% of their historically occupied habitat in the Missouri River drainage**.** In the Gallatin River portion of their native range, wild aboriginal

non-hybridized WCT remain in low density in only 0.5 of 1048 (0.1%) suitable stream miles. This mileage does not include several populations replicated in suitable fishless habitat. Recently one population (Bostwick Creek) was extirpated due to hybridization and competition with Rainbow Trout and Brook Trout, respectively.

Introductions of WCT into historically fishless or renovated streams have added another 12 miles of occupied habitat in two locations. The one remaining extant aboriginal population in the Gallatin drainage is currently at risk and may not persist over the long-term because of small population size and the downstream presence of non-native species. A secure population is one that has a high probability of persisting through time because it is isolated from the threats of non-native species and occupies adequate habitat at a high enough density to avoid suffering the negative consequences of genetic inbreeding (Wang et al. 2002). Hilderbrand and Kershner (2000) recommended a 2,500-fish minimum WCT population size for long-term persistence (>100 years). Harig and Fausch (2002) recommended the minimum amount of occupied habitat per population is 5.6 square miles (minimum watershed size) for increased likelihood of success of translocation projects. Anecdotally, numerous populations have persisted in isolated drainages for over 80 years in North Central Montana. These populations have likely survived numerous genetic bottlenecks; yet persist, sometimes with very low numbers of individuals (e.g. < 30). The proposed North Fork Spanish Creek restoration project would undoubtedly be large enough to be genetically secure over the long term. Several factors make North Fork Spanish Creek a good candidate for restoration, 1) isolation and relative protection from unwanted human movement/transfer of non-native fishes, 2) good to excellent quality habitat, 3) and an accessible location for fish barrier construction. WCT have nearly been extirpated from the Gallatin River drainage; without this project the genetic legacy of the remaining population(s) of WCT would be lost. This genetic diversity may perpetuate adaptive traits that are important to the species as a whole (Leary et al. 1998). Moreover, efforts to stabilize and increase WCT populations may prevent future listing of WCT under the Endangered Species Act and will reduce the need for special status designation.

The goal of the proposed project is to expand the current range of WCT into North Fork Spanish Creek by removing introduced trout and restocking the stream and lakes with WCT (juveniles, adults, or fertilized eggs). If implemented, the proposed action would result in the creation of a WCT population in over 17 miles of stream and two lakes – more than doubling currently occupied habitat in the Gallatin drainage.

Project Details

North Fork Spanish Creek drains northeast from the Lee Metcalf Wilderness Area, eventually joining South Fork Spanish Creek, and then ultimately the Gallatin River approximately 15 miles south of Four Corners, MT. The headwaters of North Fork Spanish Creek feature several high mountain lakes, two of which - Chiquita and Big Brother - hold naturally reproducing populations of trout (Figure 1).

Several tributaries also form and feed North Fork Spanish Creek, including, Willow Swamp, Camp, and Placer Creeks. The headwaters of Willow Swamp Creek are fishless. Lower Willow Swamp Creek supports Brook Trout. The lower reaches of Willow Swamp Creek and most of

Camp Creek support Trout, WCT, and Yellowstone Cutthroat Trout (YCT) and their hybrids. Chiquita and Big Brother lakes hold naturally reproducing populations of hybrids between YCT and Rainbow Trout. Placer Creek was fishless upstream of a barrier falls prior to a transfer of remaining non-hybridized WCT from Bostwick Creek (Bridger Mountains) in 2014. Bostwick Creek held one of the last two remaining non-hybridized populations in the Gallatin River drainage prior to 2014. Upstream invasion by Rainbow Trout and Brook Trout in Bostwick Creek necessitated a rescue to Placer Creek – the only available fishless habitat. WCT in Bostwick Creek have since been displaced by Brook Trout and/or introgressed with Rainbow Trout and no longer represent a viable population. Thus far, WCT transferred to Placer Creek appear to be spawning and reproducing at some level.

A fish barrier location was previously identified on private land with good site characteristics – e.g. confinement, bedrock, and construction access. A conceptual design with a cost opinion was developed in 2015. Design, construction, and normal maintenance of the fish barrier would be completed by the private landowner. All permits, both federal and state, would be obtained prior to any streambed or streamside work. The fish barrier would be a poured concrete structure designed similar to other structures used with success in Montana. Design criteria include both barrier height and stream velocity to prevent upstream fish passage. The barrier would be located on North Fork Spanish Creek approximately 8 miles upstream of the confluence with the Gallatin River.

Rainbow Trout and YCT readily hybridize with WCT and Brook Trout tend to displace WCT. The proposed action of establishing a non-hybridized population of WCT in North Fork Spanish Creek upstream of a proposed fish barrier requires removal of non-native trout. The only effective way to remove fish on a large scale such as in North Fork Spanish Creek is to use a piscicide. Rotenone is a commonly used piscicide that targets fish and is very effective with trout. Rotenone has no impact on terrestrial plants and animals and limited impacts to non-target aquatic organisms (aquatic insects and larval amphibians) at fish killing concentrations. FWP has a long history of using rotenone to manage fish populations in Montana that spans as far back as 1948. The department has administered rotenone projects for a variety of reasons, but principally to improve angling quality or for native fish conservation. Rotenone is a naturally occurring substance derived from the roots of tropical plants in the bean family such as the jewel vine (*Derris* spp.) and lacepod (*Lonchocarpus* spp.) that are found in Australia, southern Asia, and South America. Rotenone has been used by native people for centuries to capture fish for food in areas where these plants are naturally found. It has been used in fisheries management in North America since the 1930s. Rotenone has also been used as a natural insecticide for gardening and to control parasites such as lice on domestic livestock (Ling 2002).

Rotenone acts by inhibiting oxygen transfer at the cellular level. It is especially effective at low concentrations with fish because it is readily absorbed into the bloodstream through the thin cell layer of the gills. Mammals, birds, and other non-gill breathing organisms do not have this rapid absorption route into the bloodstream and therefore there are no effects at fish killing concentrations. The most common route of exposure to non-gill breathing animals is through ingestion. Rotenone is not well absorbed in the digestive tract and is readily broken down by digestive processes, thus terrestrial animals can tolerate exposure to concentrations much higher than those used to kill fish. Rotenone can have negative impacts on larval amphibians and

aquatic invertebrates because they breathe primarily through their skin and/or gills. Impacts to larval amphibians such as spotted frogs present in the proposed project area can be reduced by delaying rotenone application until late in the summer (August or September) when most juveniles have metamorphosed into air-breathing adults. Air-breathing adult amphibians are not affected by rotenone at fish killing concentrations (Billman et al. 2011, 2012). Impacts to aquatic invertebrates have been shown to be temporary. While sometimes significant reductions in aquatic invertebrates can follow rotenone application, populations have been shown to recover within a year or two.

The label requirements for product concentration in streams is 1 part rotenone formulation (5% rotenone) to 1 million parts water (1 ppm). The concentration of active rotenone is 1 part to 50 billion parts water – essentially a thimbleful in a swimming pool. The rotenone product proposed for use in North Fork Spanish Creek is CFT Legumine (5% rotenone). Spring areas may also be treated with the powder formulation of rotenone (Prentox, 7% rotenone) or a sand/powder mix to prevent fish from seeking these areas as freshwater refuges during the stream application. The streams would be treated using drip stations – containers that administer diluted CFT Legumine to the stream at a constant rate. These drip stations would apply rotenone to the stream at a rate of 1 ppm for 4 hours. In addition, backwaters, spring areas and small tributaries would be treated with backpack sprayers according to the CFT Legumine label specifications. The total amount of chemical to be applied to the stream is dependent on the flow of the stream and the distance downstream the chemical would remain active (determined by on-site testing). It is expected that fish killing concentrations of CFT Legumine would be present in the streams for 24 to 48 hr after application, after which time it will have naturally detoxified and diluted.

Rotenone would also be applied to Chiquita and Big Brother Lakes at a concentration of 1 ppm. The chemical would be applied to the lake using a small powered or unpowered row boat (Project File, Minimum Requirements Decision Guide). Backpack sprayers may be used to treat grassy or shallow areas around the margins of the lakes that are difficult to access with a boat. It is anticipated that the rotenone in the lake will be at a fish killing concentration for 1-3 weeks following application.

There are 3 ways in which rotenone can be detoxified; natural oxidation, dilution by freshwater and introduction of a neutralizing agent such as potassium permanganate. To prevent the rotenone from traveling downstream of the proposed treatment area, potassium permanganate would be used to neutralize any rotenone remaining in the stream below the proposed fish barrier (see Comment 2a below). The CFT Legumine label states that a minimum of 20-30 min of contact time between rotenone treated waters and the applied neutralizing agent (potassium permanganate) is necessary to fully detoxify the rotenone. Because the rotenone is not instantly detoxified downstream of the barrier site, a detoxification zone would be established. The detoxification zone is defined as the distance the stream travels in 30 minutes downstream of the fish barrier (this will likely less than ¼ mile in North Fork Spanish Creek). Potassium permanganate is readily reduced by rotenone and natural processes in the stream and therefore it is imperative that adequate permanganate be applied to the stream to still be present and active at 30 min of travel time downstream. The determination of the appropriate amount of permanganate to fully neutralize any remaining rotenone is derived by on-site testing. Stream

discharge would be measured prior to detoxification and the potassium permanganate would be applied at the rate of 3-5 ppm as specified on the CFT Legumine label.

Neutralization would commence in North Fork Spanish Creek according to the FWP Rotenone Detoxification Policy which states that detoxification with potassium permanganate should begin no less than 2 hours before the theoretical arrival time of treated waters at the detoxification station. Potassium permanganate would be directly measured in the water downstream of the application point using a colorimeter. A concentration of 0.5-1.0 ppm potassium permanganate would be maintained downstream at 30 minutes of stream travel distance to completely neutralize the rotenone. When this concentration is maintained all of the rotenone in treated water is fully neutralized. In addition to direct measurement of the potassium permanganate in the water, caged fish (trout from NFSC) would be placed in the stream downstream of the detoxification zone to monitor the effectiveness of the detoxification station during the treatment. Caged fish would also be placed and monitored in the creek immediately upstream of the detoxification station to indicate when rotenone is no longer present in the stream and when detoxification is no longer required. If sentinel fish in treated stream water show no signs of distress within 4 hours, the stream water is considered no longer toxic, and detoxification can be discontinued. Neutralization would continue until the theoretical time in which all treated waters would have passed the fish barrier and when sentinel fish can survive for an additional 4 hours. It is anticipated that this would occur in North Fork Spanish Creek within 24-48 hr after rotenone application. Successful application of potassium permanganate would prevent any killing of non-target fish below the proposed project area.

The transportation of personnel and equipment to the project site under the proposed action would be accomplished with packhorses or if circumstances arise (e.g. timber blow down) with a helicopter (Project File, Minimum Requirements Decision Guide). Should use of a helicopter be necessary, only the minimum amount of trips (3-5) necessary would be made to and from a designated loading area located off of the wilderness area.

Dead fish resulting from the treatment with CFT Legumine in the stream and in lakes would be left on-site in the water. Studies in Washington State indicate that approximately 70% of rotenone-killed fish sink and do not float (Bradbury 1986) and decompose within a week or two. Dead fish stimulate plankton and other invertebrate growth and aid in invertebrate ecological recovery following treatment.

If all the non-native trout are not removed during the first treatment, it may be necessary to implement a second treatment to achieve the desired objectives of complete removal of non-native fish. To determine if complete fish removal is achieved, streams would be electrofished following treatment. In addition, eDNA may be used to confirm electrofishing efforts or vice-versa. eDNA is a powerful genetic tool that allows detection of fish through sloughing of skin or in fecal matter. If a second treatment is necessary, work would be completed the following year. In the event that an additional treatment is necessary, landowners, stakeholders and other interested parties would be notified.

To minimize the risk of the public being exposed to rotenone or treated waters, public access to trails in the area would be closed during application of rotenone – likely one week. The High

Lake trailhead (412) would be posted with signs indicating the closure. Other potential access points (i.e., trails) would also be signed. Additional signs would be placed at stream crossings informing the public of the presence of treated waters and to keep out while rotenone is being applied. Additionally, the timing of the treatment will be coordinated with anyone grazing livestock. Under FWP policy, rotenone treatments must be conducted when no livestock are present.

Once non-native trout are removed from North Fork Spanish Creek it will be restocked with WCT obtained from nearest neighbor populations. The source of these fish has not yet been determined but they will likely be WCT from within the Gallatin Drainage. Should issues with nearest source populations arise, donors from adjacent basins may be considered – i.e. Madison and Jefferson. Potential sources of fish that are in immediate need of conservation include Wildhorse (Gallatin Drainage), Wally McClure (Madison Drainage), and Last Chance creeks (Madison Drainage). Donor fish may also be obtained from waters already restored with Gallatin River drainage WCT (e.g. Elkhorn Creek and Placer Creek – Gallatin Drainage).

Funding

Project personnel expenses would be covered under standard FWP and US Forest Service (USFS) budgets as a part of normal duties. Design and construction of the fish barrier would be sourced from private entities and Federal and State grant monies. Supplies and materials necessary for fish removal, including, CFT Legumine and potassium permanganate account for a small portion of overall project costs. No additional funding would be required for personnel services by FWP or USFS.

PART II. ALTERNATIVES

Alternative 1 – No action

The no action alternative would allow status quo management to continue. The hybrid and Brook Trout fishery in North Fork Spanish Creek, Chiquita, and Big Brother lakes would remain the same. The "No Action" alternative would not fulfill the State's obligation to seek to ensure the long-term persistence of WCT distributed across its historical range (FWP 2007). North Fork Spanish Creek is an ideal location to restore WCT because of isolation, high quality habitat and the presence of a good barrier site with construction access. Under the "No Action" alternative WCT in the Gallatin River drainage would not be replicated and would be one step closer to extinction.

Although the "No Action" alternative would not accomplish the goals of WCT conservation, it would avoid any temporary impacts from increased foot and horse traffic in the Lee Metcalf Wilderness area. The selection of the "No Action" alternative also would not affect trail access to the wilderness for the week during piscicide treatment. Temporary impacts to non-target aquatic invertebrates and to amphibians would be avoided. Further, there would be no temporary loss of non-native trout fisheries in North Fork Spanish Creek or Chiquita and Big Brother lakes with the "No Action" alternative.

Because the "No Action" alternative does not meet the goals of the USFS, FWP, and conservation organizations in preventing extinction of WCT, the "No Action" alternative is not considered the preferred alternative. If the "No Action" alternative was selected and the downward trend in WCT in the Missouri River drainage and other areas of Montana continues it is likely that the fish will warrant further protection such as listing under the Endangered Species Act. Such a listing could have wide ranging ramifications on land use decisions, particularly on federal lands.

Alternative 2 – Proposed Action: Restoration of WCT in North Fork Spanish Creek through the removal of non-native trout using rotenone and restocking of Cutthroat Trout.

This alternative benefits WCT through an increase in number of stream miles inhabited by WCT. Approximately 17 miles of North Fork Spanish Creek and its tributaries would be treated with rotenone to remove non-native trout. Two small lakes, Chiquita and Big Brother would also be treated with rotenone to remove non-native trout. The proposed increase in stream miles supporting WCT would nearly double the current number of miles within the Gallatin River drainage. Replication of at risk populations within the Gallatin or equivalent drainage is important in reducing extinction risk. WCT native to the Gallatin River system may have local adaptations; these adaptations are the genetic legacy of Montana WCT, and should be preserved to the best of our abilities. By completing this project, WCT would take one step back from potential future listings under the Endangered Species Act. A proactive approach is the surest way to prevent future listing and associated regulatory requirements.

Under the proposed action, non-native trout would be removed with rotenone. There will be some lost angling in the period after treatment and before North Fork Spanish Creek holds fishable populations – typically 3 to 5 years. If enough demand for the lake fisheries exists, sterile/triploid WCT could be stocked until self-sustaining populations take hold.

Under this alternative, there will be increased presence of fisheries personnel during piscicide treatments and during restoration efforts, typically two or three weeks for 7 to 9 years. Non-mechanized equipment would be the first choice in accessing project areas in the Lee Metcalf Wilderness Area (i.e. pack stock) with the exception of a battery operated injector pump to increase the release depth of the piscicide.

If either of the initial lake treatments at Big Brother Lake or Chiquita Lake were deemed unsuccessful, are thought to be the result of or partially the result of the use of non-mechanized row boats, the Forest Service can authorize the use of an electric or combustible gas motor per USFS's Minimum Requirements Decision Guide. If the user built access trail to Chiquita Lake closes by downed windblown trees and safety to pack stock and stock handlers is compromised, the Forest Service can authorize the use of low elevation non-landing helicopter flights to transport equipment and supplies to and from private land. It is estimated that it would take two flights before and after the Chiquita Lake treatments to ferry gear.

Because spawning in Chiquita Lake occurs in the outlet stream, this could pose some problems in reestablishing the WCT using streamside incubators. If restocking efforts using streamside incubator methods are deemed unsuccessful, low elevation non-landing helicopter flights would be authorized to stock WCT until the population becomes self-sustaining. It is estimated this would take one flight each year for two to three years. No other flights would be required to achieve the project objectives at either Big Brother Lake or other wilderness streams.

Alternative 3 – Mechanically remove non-native trout from North Fork Spanish Creek.

Electrofishing has been used as a non-native fish removal tool with success in small, single thread, simplistic streams. Typically, a stream that is a candidate for electrofishing removals will be less than 2 miles in length and have little woody debris, overhanging cover, and undercut banks. Electrofishing removals in these small uncomplicated systems require the use of multiple crews for two to three weeks a year for 3 to 6 years. North Fork Spanish Creek is far too complex a system for this technique to be attempted. Since one of the primary goals of this project is to replicate non-hybridized fish, there can be zero tolerance for hybrids in the restored stream – i.e. one fish could contaminate adaptations to local environments in donor WCT as well as break down coadapted gene complexes. This alternative was removed from further analysis because it would not meet the goals of the project.

PART III. ENVIRONMENTAL REVIEW

The index to comments provides textual detail on why impacts are unknown, nonexistent, minor, significant, and whether they can be mitigated.

A. PHYSICAL ENVIRONMENT

1. LAND RESOURCES Will the proposed action result in:	Impact Unknown	No Impact	Impact Minor	Impact Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Soil instability or changes in geologic substructure?			X			1a
b. Disruption, displacement, erosion, compaction, moisture loss, or over-covering of soil which would reduce productivity or fertility?			X			1b
c. Destruction, covering or modification of any unique geologic or physical features?		X				
d. Changes in siltation, deposition or erosion patterns that may modify the channel of a river or stream or the bed or shore of a lake?			X			1d

e. Exposure of people or property to earthquakes, landslides, ground failure, or other natural hazard?		X				

DIRECT and INDIRECT IMPACTS

No Action: Alternative 1

Under this alternative there would be no impacts to the physical environment from construction of a fish barrier. There would be no impacts from treatment with piscicides, i.e. increased human traffic.

Proposed Action: Alternative 2

Comment 1a, 1b, 1d: If the proposed action is implemented, a poured concrete fish barrier would be constructed at the downstream end of the treatment area. Construction activities would be limited to the immediate barrier construction area (within 200-300 meters; Figure 1). Heavy equipment necessary for construction would access the proposed barrier site on a private road. All permits necessary to work in and around Smith Creek would be obtained, including: Montana Stream Protection Act (SPA 124), Short-Term Water Quality Standard for Turbidity (318 Authorization), and Federal Clean Water Act (404) permits. Construction Best Management Practices (BMPs) to reduce erosion and sedimentation would be used and would include but may not be limited to the following measures:

- Temporary diversions for storm runoff of North Fork Spanish Creek flows shall be constructed as specified and as needed to direct flows around the work area. Diversions shall be designed, implemented, and maintained by the contractor in accordance with BMPs to control erosion and sediment release into waterways. BMPs may include, but are not limited to, temporary berms, cofferdams, sediment basins, ditches, silt fencing, straw bales, straw mulch, and erosion control matting.

- The contractor shall plan and execute work to control and minimize surface runoff from cuts, fills, and other disturbed areas. The contractor shall prevent sediment and/or sediment laden water from entering North Fork Spanish Creek to the extent practicable.

- All dewatering flows collected from open sumps or trenches or excavations shall be routed through sediment retention structure(s) prior to discharge to North Fork Spanish Creek.

- BMP measures (wattles, erosion blanket, silt fence) shall be installed along the margin of North Fork Spanish Creek prior to any earthwork which could release sediment to Smith Creek. The BMPs shall remain until vegetation is established. Disturbed areas would be mulched and seeded with a native plant seed mixture.

CUMULATIVE IMPACTS

The North Fork Spanish Creek drainage was picked primarily because of its remoteness, habitat quality and quantity (stream miles and lake acres) and suitable barrier site. The majority of the project area is either located in wilderness or inventoried roadless area. Although, land management and recreational activities still occur within the project area both on National Forest and privately owned lands (Table 2).

Table 2. List of ongoing, proposed and reasonably foreseeable activities within the North Fork Spanish Creek sub-watershed above the proposed fish barrier.

Activity	Private Land	National Forest
Trails & Trails Maintenance	X	X
Roads & Roads Maintenance	X	
Weed Control	X	X
Bison Grazing	X	
Timber Harvest	X	
Dispersed Recreation		
Hunting & Fishing	X	X
Backpacking, Stock Packing & Camping		X

No Action: Alternative 1

Under this alternative there would be no impacts to the physical environment from construction of a fish barrier and no impacts from treatment with piscicides, i.e. increased human foot and horse packing traffic. Thus, there would be no additive/cumulative impacts from ongoing activities and temporary activities from the proposed project (Table 2). Normal maintenance and management activities and associated changes in the physical environment would not increase under this alternative.

Proposed Action: Alternative 2

The fish barrier project site would be accessed through the use of existing roads. The limited temporal and spatial extent of the proposed fish barrier would have no impacts beyond the immediate site. FWP does not expect the proposed actions to result in other actions that would create cumulative impacts to land resources in the proposed streams nor does FWP foresee any other activities in the basin that would add to impacts of the proposed action. As such there are no cumulative impacts to land resources related to construction of a fish barrier or treatment of the proposed streams and lakes with rotenone.

2. WATER Will the proposed action result in:	Impact Unknown	No Impact	Impact Minor	Impact Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Discharge into surface water or any alteration of surface water quality including but not limited to temperature, dissolved oxygen or turbidity?			X		Yes	2a
b. Changes in drainage patterns or the rate and amount of surface runoff?		X				
c. Alteration of the course or magnitude of flood water or other flows?			X			2c
d. Changes in the amount of surface water in any water body or creation of a new water body?		X				
e. Exposure of people or property to water related hazards such as flooding?		X				
f. Changes in the quality of groundwater?		X				2f
g. Changes in the quantity of groundwater?		X				
h. Increase in risk of contamination of surface or groundwater?			X		Yes	2a,f
i. Effects on any existing water right or reservation?		X				
j. Effects on other water users as a result of any alteration in surface or groundwater quality?		X				
k. Effects on other users as a result of any alteration in surface or groundwater quantity?		X				
l. Will the project affect a designated floodplain?		X				
m. Will the project result in any discharge that will affect federal or state water quality regulations? (Also see 2a)			X		Yes	2m

DIRECT and INDIRECT IMPACTS

No Action: Alternative 1

Under this alternative there would be no temporary impacts to water quality from application of a piscicide and no temporary sediment impacts from construction of a fish barrier.

Proposed Action: Alternative 2

Comment 2a: The proposed project is designed to intentionally introduce a pesticide to surface water to remove Rainbow Trout. The impacts would be short term and minor. CFT Legumine 5% rotenone is an Environmental Protection Agency registered pesticide and is safe to use for removal of unwanted fish when handled and applied according to the product label. The concentration of rotenone proposed for use is 1 part CFT Legumine formulation to one million parts of water (ppm).

To reduce the impact of the piscicide on water quality outside of the project area, a detoxification station would be established immediately downstream of the proposed barrier site. There are three ways in which rotenone can be detoxified once applied. The most common method is to allow natural breakdown to occur. Rotenone is a compound that is susceptible to natural breakdown (detoxification) through a variety of mechanisms such as water chemistry, water temperature, exposure to organic substances, exposure to air, and sunlight intensity (Ware 2002; ODFW 2002; Loeb and Engsrtom-Heg 1970; Engstrom-Heg 1972; Gilderhus et al. 1986). Rotenone persistence studies by Gilderhus et al. (1986) and Dawson et al. (1991) found that in cool water temperatures of 32 to 46ºF the half-life ranged from 3.5 to 5.2 days. Gilderhus et al. (1986) reported that 30% mortality was experienced in Rainbow Trout exposed to degrading concentrations of actual rotenone (0.004 ppm) in 46ºF pond water 14 days after a treatment. By day 18 the concentrations were sub lethal to trout. Degradation in flowing water is typically faster due to physical agitation, highly aerated water, and constant exposure to sunlight (Brown 2010). The second method for detoxification involves basic dilution by fresh water. This is naturally accomplished by return of fresh ground water or surface water flowing into a lake or stream. The final method of detoxification involves the application of an oxidizing agent like potassium permanganate. This dry crystalline substance is mixed with stream or lake water to produce a concentration of liquid sufficient to detoxify the rotenone. Detoxification of rotenone is accomplished after about 15-30 minutes of exposure time between the two compounds (Prentiss Inc. 1998, 2007). FWP expects the stream would naturally detoxify within 24-48 hrs. after application of rotenone because of natural breakdown processes. FWP policy requires that potassium permanganate be used to detoxify any remaining rotenone present in the stream at the project terminus and prevent rotenone from traveling more than ¼ mile downstream of the fish barrier.

Dead fish would result from this project. Bradbury (1986) reported that 9 of 11 water bodies in Washington treated with rotenone experienced an algae bloom shortly after treatment. This is attributed to the input of phosphorus to the water from decaying fish. Bradbury further notes that approximately 70% of the phosphorus content of the fish stock would be released into the water through bacterial decay. This action may be beneficial because it would stimulate algae production and would start the stream toward production of food for fish. Any changes or impacts to water quality resulting from decaying fish would be short term and minor.

Comment 2c: A barrier to upstream movement of non-native fishes would be constructed prior to piscicide treatment. The gradient of the stream at the proposed barrier location is high enough to prevent a significant impoundment of water. Loss of water to evaporation because of the barrier would be negligible and would not affect downstream water users. The barrier is designed to provide passage of flood flows estimated to have a recurrence interval of 100 years.

Comment 2f: No contamination of groundwater is anticipated to result from this project. Rotenone binds readily to sediments, and is broken down by soil and in water (Skaar 2001; Engstrom-Heg 1971, 1976; Ware 2002). Rotenone moves only one inch in most soil types; the only exception would be sandy soils where movement is about three inches (Hisata 2002). In California, studies where wells were placed in aquifers adjacent to and downstream of rotenone applications have never detected rotenone, rotenolone, or any of the other organic compounds in the formulated products (CDFG 1994). Case studies in Montana have concluded that rotenone movement through groundwater does not occur. For example, at Tetrault Lake, Montana neither rotenone nor inert ingredients were detected in a nearby domestic well, which was sampled two and four weeks after applying 1.8 ppm rotenone to the lake. This well was chosen because it was down gradient from the lake and also drew water from the same aquifer that fed and drained the lake. In 1998, a Kalispell-area pond was treated with Prenfish 5% rotenone. Water from a well, located 65 feet from the pond, was analyzed and no evidence of rotenone was detected. In 2001, another Kalispell-area pond was treated with Prenfish 5% rotenone. Water from a well located 200 feet from that pond was tested four times over a 21-day period and showed no sign of contamination. In 2005, FWP treated a small pond near Thompson Falls with Prenfish to remove pumpkinseeds and bass. A well located 30 yards from the pond was tested and neither Prenfish nor inert ingredients were found in the well. In Soda Butte Creek near Cooke City a well at a Forest Service campground located 50 ft from a treated stream was tested immediately following and 10 months after treatment with Prenfish and no traces of rotenone were found (Olsen 2006). Because rotenone is known to bind readily with stream and lake substrates, FWP does not anticipate any contamination of ground water as a result of this project.

Comment 2m: FWP would apply rotenone under the Montana Department of Environmental Quality (DEQ) General Permit for Pesticide Application (#MTG87000). A Notice of Intent was accepted by the Department of Environmental Quality for this project. The NOI included the waters proposed in this EA. A letter was received from DEQ dated August 13, 2012 recognizing the Notice of Intent and allowing FWP to operate under the General Permit for Pesticide Application.

By following the manufacturer's label, and conditions of the general permit for pesticide application, the alterations in water quality would be within acceptable levels under the Clean Water Act and Montana's narrative and numeric water quality standards.

CUMULATIVE IMPACTS

No Action: Alternative 1

Under this alternative there would be no cumulative impacts from temporary alteration of water quality from a piscicide treatment nor impacts to water quality from temporary increases in turbidity during fish barrier construction. No other alterations to water quality are proposed outside of the proposed project. Normal maintenance and management activities and associated changes in water quality would not increase under this alternative.

Proposed Action: Alternative 2

The proposed action of piscicide treatment and the connected action of barrier construction would have a short-term impact on water quality and invertebrate abundance (piscicides and increased localized turbidity, respectively) and potentially a longer-term impact on species community composition of primary and secondary producers in North Fork Spanish Creek. These impacts would attenuate through time and would not impact the productivity of fisheries resources after restocking. We do not expect the proposed action to result in other actions that would create cumulative impacts to water resources in North Fork Spanish Creek. Nor do we foresee any other activities in the basin that would add to impacts of the proposed action. As such there are no cumulative impacts to water resources related to construction of the barrier and treatment of North Fork Spanish Creek with piscicides.

3. AIR Will the proposed action result in:	Impact Unknown	No Impact	Impact Minor	Impact Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Emission of air pollutants or deterioration of ambient air quality? (also see 13 (c))		X				
b. Creation of objectionable odors?		X				3b
c. Alteration of air movement, moisture, or temperature patterns or any change in climate, either locally or regionally?		X				
d. Adverse effects on vegetation, including crops, due to increased emissions of pollutants?		X				
e. Will the project result in any discharge which will conflict with federal or state air quality regs?		X				

DIRECT and INDIRECT IMPACTS

No Action: Alternative 1

Under this alternative there would be no temporary increase in noise associated with; construction of a fish barrier, increased human presence during piscicide application, or the potential for limited use of motors during piscicide application (Project File, Minimum Requirements Decision Guide))

Proposed Action: Alternative 2

Comment 3b: The advantage of CFT Legumine over other rotenone products that have been used in the past is that it has less petroleum hydrocarbon solvents such as toluene, xylene,

benzene, and naphthalene. By comparison, Prenfish has a strong chemical odor. CFT Legumine is virtually odor-free and performs almost identically to older products (e.g., Prenfish, Noxfish).

A gasoline generator would be used to run a power auger at the lower end of the treatment area to dispense powdered potassium permanganate (detoxifying agent). The generator would produce some exhaust fumes that would dissipate rapidly. During construction of the barrier, the use of heavy equipment and generators would impact air quality in the vicinity of the construction project. These impacts would be limited to the periods of construction and the immediate construction area.

Decaying fish may produce a short term noxious smell. Previous treatments have shown dead fish decay rapidly and are difficult to find even after a few days post treatment.

CUMULATIVE IMPACTS

No Action: Alternative 1

Under this alternative there would be no additive or cumulative impacts from spatially and temporally short term reductions in air quality. There would be no short term increases in smells from application of piscicides and from construction of a fish barrier (exhaust). Normal maintenance and management activities and associated increases in air quality would not change under this alternative.

Proposed Action: Alternative 2

Impacts to air quality from the proposed actions would be short term and minor. FWP does not expect the proposed action to result in other actions that would create cumulative impacts to air quality near North Fork Spanish Creek. Nor does Montana Fish, Wildlife & Parks foresee any other activities in the basin that would add to impacts of the proposed action. As such there are no cumulative impacts to air quality related to treatment of the proposed streams with piscicides or associated barrier construction.

4. VEGETATION Will the proposed action result in:	Impact Unknown	No Impact	Impact Minor	Impact Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Changes in the diversity, productivity or abundance of plant species (including trees, shrubs, grass, crops, and aquatic plants)?			X			4a
b. Alteration of a plant community?		X				
c. Adverse effects on any unique, rare, threatened, or endangered species?		X				4c

d. Reduction in acreage or productivity of any agricultural land?		X				
e. Establishment or spread of noxious weeds?		X				4e
f. Will the project affect wetlands, or prime and unique farmland?		X				

DIRECT and INDIRECT IMPACTS

No Action: Alternative 1

Under this alternative there would be no short-term impacts to vegetation near the fish barrier construction site or trampling of vegetation through horse packing and foot traffic during application of piscicides.

Proposed Action: Alternative 2

Comment 4a: During treatment, workers would park on developed access roads and walk the stream corridor to their drip stations. There would be some trampling of vegetation along the stream during the placement and monitoring of drip stations and sentinel fish locations; however, the degree of impact to vegetation is not anticipated to affect plant vigor. Rotenone does not have an effect on plants at concentrations used to kill fish. Impacts from trampling vegetation are expected to be short term and minor. During barrier construction there would be localized impacts to vegetation at the proposed barrier site (see Land Resources). Heavy equipment necessary for construction would access the proposed barrier along a private road. Impacts to the road should be temporary and minor. Impacts during construction would be limited to staging areas and ground adjacent to the barrier (within 200 to 300 meters). After construction, this area would be scarified, mulched, and reseeded with a native plant mix.

Comment 4c: A search for species of special concern (S2 to S3, At Risk to Potentially at Risk) within Montana revealed the following have been reported in Gallatin County, Kruckeberg's Swordfern, Annual Indian Paintbrush, Slender Indian Paintbrush, Whitestem Goldenbush, Dwarf Purple Monkeyflower, Nodding Locoweed, Whipple's Beardtongue, Beaked Spikerush, Oregon Checker-mallow, Slender Thelypody, Dwarf Onion, Many-ribbed Sedge, Small-winged Sedge, and Small Dropseed. Small Wing Sedge and Small Dropseed are the only species at level G2, with very limited or declining populations globally. Ute Ladies' Tresses are listed as threatened under the Endangered Species Act and have been found in Gallatin County though not near North Fork Spanish Creek. Whitebark Pine is a candidate species under the Endangered Species Act. Whitebark Pine would not be affected by either fish barrier activities or piscicide application.

No impacts to these species are anticipated as a result of the proposed action. All rotenone products, including CFT Legumine, have no impacts on aquatic or terrestrial plant species at fish killing concentrations. Some trampling is possible due to increase foot traffic along the proposed streams; however, these impacts should be minimal because of existing USFS trails or game trails that provide good foot access to the sites. Increased cross country use by personnel will be

limited spatially and temporally. Moreover, none of these species have been known to occur at the proposed fish barrier site.

Comment 4e: Vehicles would receive an undercarriage wash and horses would have weed free hay to reduce the potential for spread of noxious weeds. If necessary, all non-wilderness helicopter landing/staging areas would be inventoried for noxious weeds and moved if any noxious weeds were found.

CUMULATIVE IMPACTS

No Action: Alternative 1

Under this alternative there would be no cumulative or additive impacts to disturbance of vegetation. Normal maintenance and management activities and associated disturbance of vegetation would not increase under this alternative.

Proposed Action: Alternative 2

Impacts to vegetation from the proposed action would be short term and minor. FWP does not expect the proposed action to result in other actions that would create cumulative impacts to vegetation in the proposed WCT restoration stream. If the new fisheries were to attract more recreational use, vegetation could potentially suffer from increased trampling. However, based on other similar WCT fisheries and their limited use, FWP would conclude that it is very unlikely that the new WCT fishery would attract significant interest and associated higher use levels. FWP does not foresee any other activities in the basin proposed for WCT restoration that would add to impacts of the proposed action. As such there are no cumulative impacts to vegetation related to the proposed action.

5. FISH/WILDLIFE Will the proposed action result in:	Impact Unknown	No Impact	Impact Minor	Impact Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Deterioration of critical fish or wildlife habitat?		X				
b. Changes in the diversity or abundance of game animals or bird species?			X		Yes	5b
c. Changes in the diversity or abundance of nongame species?			X		Yes	5c
d. Introduction of new species into an area?			X			5d
e. Creation of a barrier to the migration or movement of animals?		X				
f. Adverse effects on any unique, rare, threatened, or endangered species?			X			5f

g. Increase in conditions that stress wildlife populations or limit abundance (including harassment, legal or illegal harvest or other human activity)?			X			5g
h. Will the project be performed in any area in which TE&S species are present, and will the project affect any TE&S species or their habitat? (Also see 5f)			X		Yes	See 5f
i. Will the project introduce or export any species not presently or historically occurring in the receiving location? (Also see 5d)		X				

DIRECT and INDIRECT IMPACTS

No Action: Alternative 1

Under this alternative, the current non-native trout assemblage in North Fork Spanish Creek and its tributaries would remain the same. There would be no increase in stream miles with non-hybridized WCT and no reduction in the threat of extinction of WCT. Under this alternative, a fish barrier would not be constructed on North Fork Spanish Creek and free movement upstream of fishes would be unchanged.

Proposed Action: Alternative 2

Comment 5b: This project is designed to eradicate non-native trout in North Fork Spanish Creek upstream of a proposed fish barrier (Figure 1). However, this impact is minor and temporary because WCT (also a game fish) would be restocked and would eventually repopulate the stream. Therefore, there would be no net loss of habitat occupied by self-sustaining populations of wild game fish. After removal of non-native trout there would be a period of time when North Fork Spanish Creek and its tributaries would be fishless or hold low densities of trout (3-5 years). The two lakes, Chiquita and Big Brother, would also be fishless for this period of time. Mitigation could include limited stocking of sterile WCT in Chiquita or Big Brother lakes if public need warrants.

When applied at fish killing concentrations rotenone has no impact on terrestrial wildlife/game species including birds and mammals that consume dead fish or treated water.

Comment 5c:

Aquatic Invertebrates:

Numerous studies indicate that rotenone has temporary effects on aquatic invertebrates. The most noted impacts can be a substantial reduction in invertebrate abundance and diversity. In a study of the impacts of a rotenone treatment in Soda Butte Creek in South Central Montana, aquatic invertebrates of nearly all taxa declined dramatically immediately post rotenone

treatment; however, only one year later nearly all taxa were fully recovered and at greater abundance than pre-treatment (Olsen and Frazer 2006). Another study reported that no long-term significant reduction in aquatic invertebrates was observed after application of double the normal application strength of rotenone (Houf and Campbell 1977). Chandler and Marking (1982) found that clams and snails were between 50 and 150 times more tolerant than fish to Noxfish (5% rotenone formulation). In all cases, the reduction of aquatic invertebrates was temporary, and most treatments used a higher concentration of rotenone than proposed for these projects (Schnick 1974). In a study on the relative tolerance of different aquatic invertebrates to rotenone, Engstrom-Heg et al. (1978) reported that the long-term impacts of rotenone are mitigated because those insects that were most sensitive to rotenone also tended to have the highest rates of reproduction and recolonization. Temporary changes in aquatic invertebrate community structure due to a rotenone treatment could be similar in magnitude to what is observed after natural (e.g. fire) and anthropogenic (livestock grazing) disturbances (Wohl and Carline 1996; Mihuc and Minshall. 2005; Minshall 2003), though the physical impacts and resulting modifications of invertebrate assemblages after these types disturbances can last for a much longer period than a piscicide treatment.

Because of their short life cycles (Anderson and Wallace 1984), good dispersal ability (Pennack 1989), and generally high reproductive potential (Anderson and Wallace 1984), aquatic invertebrates are capable of rapid recovery following disturbance (Boulton et al. 1992; Matthaei et al. 1996). Headwater reaches and tributaries to the proposed WCT restoration streams that do not hold fish would not be treated with rotenone and would provide a source of aquatic invertebrate colonists that could drift downstream. In addition, recolonization would include aerially dispersing invertebrates from upstream and downstream areas (e.g. mayflies, caddisflies, dipterans, stoneflies).

Based on these studies, FWP would expect the aquatic invertebrate species composition and abundance in the streams proposed for treatment with CFT Legumine to return to pre-treatment diversity and abundance within one to two years after treatment.

In Montana, aquatic invertebrates are routinely collected prior to WCT restoration projects in mountains streams. In all cases, these collections have shown aquatic invertebrate assemblages typical of headwater streams in North Western Montana, and in no cases have threatened or endangered species been discovered. FWP expects that the proposed streams contain a similar aquatic invertebrate assemblage as found in other nearby streams and the possibility of eliminating a rare or endangered species is minimal. Rare or endangered species are typically found in novel habitats, including glacier melt *(*e.g. *Lednia spp.*stoneflies*)* and hot springs. North Fork Spanish Creek exhibits typical spring snowmelt characteristics and would likely host a common assemblage of invertebrates. Aquatic invertebrates would be collected from the stream prior to treatment with rotenone and 1 year post treatment to monitor the recovery of aquatic invertebrate populations.

Birds and Mammals:

Mammals are generally not affected by rotenone at fish killing concentrations because they neutralize rotenone by enzymatic action in their stomach and intestines (AFS 2002). Studies of risk for terrestrial animals found that a 22 pound dog would have to drink 7,915 gallons of treated lake water within 24 hours, or eat 660,000 pounds of rotenone-killed fish, to receive a lethal dose (CDFG 1994). The State of Washington reported that a half pound mammal would need to consume 12.5 mg of pure rotenone to receive a lethal dose (Bradbury 1986). Considering the only conceivable way an animal can consume rotenone under field conditions is by drinking lake or stream water or consuming dead fish, a half-pound animal would need to drink 16 gallons of water treated at 1 ppm CFT Legumine.

The EPA (2007) made the following conclusion for small mammals and large mammals;

> *When estimating daily food intake, an intermediate-sized 350 g mammal will consume about 18.8 g of food. Using data previously cited from the common carp with a body weight of 88 grams, a small mammal would only consume 21% (18.8/88) of the total carp body mass. According to the data for common carp, total body residues of rotenone in carp amounted to 1.08 µg/g. A 350-g mammal consuming 18.8 grams represents an equivalent dose of 20.3 µg of rotenone; this value is well below the median lethal dose of rotenone (13,800 µg) for similarly sized mammals. When assessing a large mammal, 1000 g is considered to be a default body weight. A 1,000g mammal will consume about 34 g of food. If the animal fed exclusively on carp killed by rotenone, the equivalent dose would be 34 g *1.08 µg/g or 37 µg of rotenone. This value is below the estimated median lethal equivalent concentration adjusted for body weight (30,400 µg). Although fish are often collected and buried to the extent possible following a rotenone treatment, even if fish were available for consumption by mammals scavenging along the shoreline for dead or dying fish, it is unlikely that piscivorous mammals will consume enough fish to result in observable acute toxicity.*

Similar results determined that birds required levels of rotenone at least 1,000 to 10,000-times greater than is required for lethality in fish (Skaar 2001). Cutkomp (1943) reported that chickens, pheasants, and members of lower orders of *Galliformes* were quite resistant to rotenone, and four day old chicks were more resistant than adults. Ware (2002) reports that swine are uniquely sensitive to rotenone and it is slightly toxic to wildfowl, but to kill Japanese quail required 4,500 to 7,000 times more than is used to kill fish.

The EPA (2007) made the following conclusion for birds;

> *Since rotenone is applied directly to water, there is little likelihood that terrestrial forage items for birds will contain rotenone residues from this use. While it is possible that some piscivorous birds may feed opportunistically on dead or dying fish located on the surface of treated waters, protocols for piscicidal use typically recommend that dead fish be collected and buried, rendering the fish less available for consumption (see Section IV). In addition, many of the dead fish will sink and not be available for consumption by birds. However, whole body residues in fish killed with rotenone ranged from 0.22 µg/g in yellow perch (Perca flavescens) to 1.08 µg/g in common carp (Cyprinus carpio; Jarvinen and Ankley 1998). For a 68 g yellow perch and an 88 g*

carp, this represents totals of 15 µg and 95 µg rotenone per fish, respectively. Based on the avian subacute dietary LC_{50} of 4,110 mg/kg, a 1,000-g bird would have to consume 274,000 perch or 43,000 small carp. Thus, it is unlikely that piscivorous birds will consume enough fish to result in a lethal dose.

The primary disturbance to threatened species or species of special concern would be associated with presence of humans, transport of gear and supplies by horses and hikers, and potential delivery of WCT by helicopter. This increase in noise and human presence would be of short duration, lasting no more than 5 days. This activity and presence would likely result in temporary displacement of most species if they were occupying the project area before the project began. If the project were not successful in the first year, a second round of piscicide application would occur the following year. None of the project activities would affect the habitat of these species or alter their food base. The presence of dead fish would increase scavenging by species prone to consuming carrion. As discussed in Comment 5c: Changes in the Diversity or Abundance of Nongame Species, exposure to rotenone from drinking water or eating dead fish or invertebrates does not pose a threat given the exceedingly low concentration of rotenone in water and dead animal tissues, and the rapid breakdown of the rotenone in the environment

Amphibians and Reptiles:

Rotenone can be toxic to gill breathing larval amphibians, though air breathing adults are less sensitive. Chandler and Marking (1982) found that Southern Leopard frog tadpoles were between 3 and 10 times more tolerant than fish to Noxfish (5% rotenone formulation). Grisak et al. (2007) conducted laboratory studies on Long-Toed Salamanders, Rocky Mountain Tailed frogs (*Ascaphus truei*), and Columbia Spotted frogs and concluded that the adults of these species would not suffer an acute response to Prenfish at trout killing concentrations (0.5-1 ppm) but the larvae could be affected. Billman et al. (2011, 2012) also found impacts of rotenone on larval amphibians. These authors recommended implementing rotenone treatments at times when the larvae are not present, such as the fall, to reduce the chance of exposure to rotenone treated water and potential impacts to larval amphibians. The proposed stream would be scheduled for treatment in August or September, which would reduce but not eliminate potential impacts to larval amphibians. Any reduction in amphibian abundance would be expected to be short term because of the low sensitivity of adults to rotenone, and because most larval amphibians, with the exception of tailed frogs, would have metamorphosed by August and September, when the treatment is planned. Billman et al. (2012) found that while larval amphibians present during field applications of rotenone suffered high mortality, numbers the following year were similar to pre-treatment levels. Based on this information FWP would expect the impacts to non-target amphibians and reptiles in the streams proposed for WCT restoration to range from non-existent to short term and minor.

Comment 5d: WCT are native to North Fork Spanish Creek in the proposed project area. Therefore, following non-native trout removal, WCT will be introduced upstream of the proposed fish barrier. There should be no impacts resulting from WCT introduction beyond those present for the current non-native trout fisheries because the species occupy similar aquatic niches.

Comment 5e: This project proposes construction of a fish barrier to protect reintroduced WCT. Remaining pure populations on the east side of the Continental Divide invariably exist because of man-made or natural fish barriers. Fish barriers are a part of the landscape and the only feasible way to protect WCT from non-native fishes.

Comment 5f:

Terrestrial Organisms:

Wolverines have been reported in the general area of the proposed project. Observations of Wolverines have occurred within the general area within the past 10 years (Montana Natural Heritage Field Guide). Their density in the area is likely to be low, with few observations reported. Wolverines occupy alpine areas, and coniferous or boreal forests. They typically have large home ranges and low densities - one per 25 square miles (Cegelski et al. 2003). Project activities, including piscicide application and fish reintroduction, would be short-term and have minor displacement effects on Wolverines should they be present during the project. Given their tendency to be wide-ranging, temporary displacement, in the event they are occupying the project area, would result in them leaving a small portion of their home range. This disturbance would be of short duration, lasting no more than 5 days.

Canada Lynx are listed as threatened on under the Endangered Species Act. They may occur in low densities near the proposed project; however, there have been few observations of Canada Lynx in the project area. This species is non-migratory, but is wide ranging and movements of up to 125 miles have been recorded for Canada Lynx in Montana (Hash 1990). Snowshoe Hare are the preferred prey item of the Canada Lynx; however, they will also consume mountain grouse, a variety of rodents, shrews, and occasionally will prey on ungulates and consume carrion.
The effect of this project on Canada Lynx would likely be short-term and minor. Given their large home ranges, the potential to encounter a Lynx is small. The presence of humans, horses, and a helicopter may result in temporary displacement during the 4 to 5 days of the project. The piscicide treatment would not have an effect on most of their prey species, although as occasional consumers of carrion, they may feed on dead fish. As with other mammals, the dose of rotenone resulting from opportunistic feeding is thousands of times lower than toxic levels.

The Grizzly Bear is another listed species with considerable potential to occur in the project area. The Montana Natural History Program field guide data indicate they are present at relatively high densities and sightings have been recent. Although project activities, such as the use of helicopters or pack stock, may temporarily displace bears, habituated bears may stay near the project area. Grizzly Bears pose a much larger threat to fieldworkers than the project poses to Grizzly Bears. Fieldworkers would be required to carry bear spray. To minimize the potential for conflict with Grizzly Bears, field crews would adhere to requirements outlined in the U.S. Department of Agriculture FS Food Storage Special Order LC-00-18. These requirements call for storing food for humans and livestock in a bear-resistant manner and packing out any leftover food and garbage. In addition, piscicide containers would be securely stored. Storing food properly, keeping a clean camp, and maintaining an audible presence while in the field would reduce the potential for bear encounters and reduce the possibility of habituation. Given these

protective measures, effects on grizzly bears would be short-term and minor. The piscicide treatment would not have an effect on most of their prey species, although as occasional consumers of carrion, they may feed on dead fish. As with other mammals, the dose of rotenone resulting from opportunistic feeding is thousands of times lower than toxic levels.

Aquatic Organisms:

Westslope Cutthroat Trout, including some populations of slightly hybridized WCT, are considered a sensitive species and a species of special concern. The intent of the Proposed Action is to conserve WCT by expanding their range into North Fork Spanish Creek, Chiquita and Big Brother lakes (17 miles of stream). It would also conserve locally adapted gene complexes that could be used in future reintroduction or restoration projects. Therefore, the expected outcome of the proposed project would be greatly beneficial to the long-term conservation of WCT.

The possibility of eliminating a rare or endangered species of aquatic invertebrate in the proposed streams by treating with rotenone at proposed concentrations is very unlikely. The Montana Natural Heritage Program lists no species of concern or potential species of concern of aquatic invertebrates in immediate North Fork Spanish Creek drainage. A search for species of special concern using the Montana Natural History Program database (S2 to S3, At Risk to Potentially at Risk) within Montana revealed the following have been reported in Gallatin County, Frigga Fritillary Butterfly, Hooked Snowfly, Springs Stripetail, Striate Disc, Western Pearlshell Mussel, and Gallatin Mountainsnail. The Gallatin Mountainsnail is only native to nearby Stormcastle Creek. The Frigga Butterfly and other aforementioned invertebrates are not globally rare and are common throughout their extended range. Western Pearlshell Mussels have not been found in North Fork Spanish Creek. FWP policy requires the collection of aquatic invertebrate samples prior to piscicide treatment. In the unlikely event any of these species were present they would not be eliminated from the entirety of North Fork Spanish Creek.

Reptiles and Amphibians:

Potential species of special concern within the amphibian and reptile groups observed in Gallatin County, are limited to, Western Toad *(Anaxyrus boreas)*, Plains Spadefoot *(Spea bombifrons)*, Greater Short-horned Lizard *(Phrynosoma hernandesi* (Montana Natural History Program). Other reptiles and amphibians found within the proposed treatment areas include, Columbia Spotted Frog (*Rana pretiosa*), Western Terrestrial Garter (*Thamnophis elegans*), Common Garter (*T. sirtalis*), and Rubber Boa (*Charina bottae*). The two species of gartersnake, likely occur along North Fork Spanish Creek and its tributaries, and a reduction in aquatic based food may affect these snakes, although these species are generalists and would still have forage from terrestrial sources. Similarly, the Columbian Spotted Frog regularly forages along stream margins. Effects on these reptile and amphibian predators would likely be short-term and minor, with temporary displacement or reductions in population size.

Comment 5g. There is the potential for displacement of some animals during the implementation of this project (see Comment 5f). Mule Deer, Elk, Moose and potentially other

big game species and species mentioned above (Comment 5f) may be temporarily displaced as crews are present in the drainage performing the proposed work. However, these impacts should only be minor and temporary. The total treatment should be completed within 4-6 days.

The Forest Service is required to analyze and disclose the potential effects or impacts of the proposed project on sensitive and threatened species. Table 3 is a summary of the effects determinations made for each of the previously listed aquatic, terrestrial and avian species. The complete Biological Evaluations and Biological Assessments are included within the project file and are available upon requested.

Table 3. Summary of effects determinations for each of the aquatic, terrestrial and avian sensitive and threatened species.

Class	***Class Common***	***Scientific Name***	***U.S. Forest Service Status***	***Project Determinations***
Amphibia	Western toad	*Anaxyrus boreas*	Sensitive	MIIH
	Northern leopard frog	*Rana pipiens*	Sensitive	NI
	Plains spadefoot	*Spea bombifrons*	Sensitive	NI
Bivalvia or Mollusks	Western pearlshell mussel	*Margaritifera falcata*	Sensitive	NI
Fish	Westslope Cutthroat Trout	*Oncorhynchus clarkii lewisi*	Sensitive	BI
Aves	Harlequin duck	*Histrionicus histrionicus*	Sensitive	NI
	Bald eagle	*Haliaeetus leucocephalus*	Sensitive	NI
	American peregrine falcon	*Falco peregrinus anatum*	Sensitive	NI
	Black-backed woodpecker	*Picoides arcticus*	Sensitive	NI
	Flammulated owl	*Otus flammeolus*	Sensitive	NI
	Trumpeter swan	*Cygnus buccinator*	Sensitive	NI
Mammalia	Townsend's big-eared bat	*Corynorhinus townsendii*	Sensitive	NI
	Gray wolf	*Canis lupis*	Sensitive	MIIH
	Bighorn sheep	*Ovis canadensis*	Sensitive	NI
	North American wolverine	*Gulo gulo luscus*	Proposed	Not Likely to Jeopardize the continued existence of the wolverine
	Grizzly bear	*Ursus arctos*	Threatened	NLAA
	Lynx	*Lynx canadensis*	Threatened	NLAA
	Lynx	*Lynx canadensis*	Critical Habitat	NE

Biological Evaluation Determinations for Forest Service Sensitive Species

- **NI** = **N**o **I**mpact
- **MIIH** = **M**ay **I**mpact **I**ndividuals or **H**abitat, but will not likely contribute to a trend towards Federal listing or loss of viability to the population or species
- **WIFV** = **W**ill **I**mpact individuals or habitat with a consequence that the action may contribute to a trend towards **F**ederal listing or cause a loss of **V**iability to the population or species
- **BI** = **B**eneficial **I**mpact

Biological Assessment Determinations for Federally ESA Listed Species

- **NE** = **N**o **E**ffect
- **NLAA** = May affect, but **N**ot **L**ikely to **A**dversely **A**ffect
- **LAA** = May affect, and is **L**ikely to **A**dversely **A**ffect

CUMULATIVE IMPACTS

No Action: Alternative 1

Under this alternative there would be no cumulative or additive changes in species composition in North Fork Spanish Creek and its tributaries. Normal maintenance and management activities would have no positive impact to WCT populations.

Proposed Action: Alternative 2

Impacts to fish and wildlife from the proposed action would be short term and minor. Montana FWP does not expect the proposed action to result in other actions that would create cumulative impacts to fish and wildlife resources within the project area. If the new fishery attracts more recreational use, fish and wildlife resources could potentially suffer from the increased presence of humans. However, based on use patterns of other WCT fisheries, FWP would conclude that it is very unlikely that the new WCT fishery would attract significant interest and associated higher use levels. The current non-native trout fishery would be replaced by WCT fisheries that occupy a similar niche and would provide similar ecological functions and provide for similar angling opportunities. FWP does not foresee any other activities in the basin that would add to impacts of the proposed action. As such there are no cumulative impacts to non-target organisms related to construction and the treatment of the proposed stream.

B.HUMAN ENVIRONMENT

6. NOISE/ELECTRICAL EFFECTS Will the proposed action result in:	Impact Unknown	No Impact	Impact Minor	Impact Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Increases in existing noise levels?			X		Yes	6a
b. Exposure of people to serve or nuisance noise levels?			X			6a
c. Creation of electrostatic or electromagnetic effects that could be detrimental to human health or property?		X				
d. Interference with radio or television reception and operation?		X				

DIRECT and INDIRECT IMPACTS

No Action: Alternative 1

Under this alternative there would be no temporary increases in noise levels in the project areas due to barrier construction; and potential use of helicopters, motors, or generators.

Proposed Action: Alternative 2

Comment 6a: Noise levels would increase temporarily in the event a helicopter is used to access the treatment area. Some noise may be created through the use of a motor to dispense rotenone in lakes. A gasoline powered generator would be used to apply potassium permanganate at the fish barrier site downstream of the Lee Metcalf Wilderness Area. During construction of the fish barrier there would be increased noise from construction equipment in the immediate area. The fish barrier site is located on private property far enough from wilderness areas to have no impact. Other application equipment that would be used in the wilderness is not mechanized and produces no noise. These impacts should be minor and temporary as the use of the helicopter and boat is expected to last only 1 to 2 days. The noise impacts in the wilderness are anticipated to only affect wildlife species because the drainage will be closed to public access during the application of rotenone. Noise effects on wildlife are expected to be only minor and temporary. It should be noted that FWP biannual helicopter flights occur over numerous wilderness areas during the stocking of high elevation lakes with WCT.

CUMULATIVE IMPACTS

No Action: Alternative 1

Under this alternative there would be no additive or cumulative increases in noise associated with the proposed project. Under normal operations and maintenance by private property owners, national forest personnel and the public - noise produced would be unchanged.

Proposed Action: Alternative 2

Increases in noise from the proposed action would be short term and minor. FWP does not expect the proposed action to result in other actions that would create increased noise in the stream proposed for WCT restoration. FWP does not foresee any other activities in the basin that would add to impacts of the proposed action. As such there are no cumulative impacts related to noise from the proposed treatment of the stream and lake with piscicides.

7. LAND USE Will the proposed action result in:	Impact Unknown	No Impact	Impact Minor	Impact Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Alteration of or interference with the productivity or profitability of the existing land use of an area?		X				
b. Conflicted with a designated natural area or area of unusual scientific or educational importance?			X			7b
c. Conflict with any existing land use whose presence would constrain or potentially prohibit the proposed action?			X			7c

d. Adverse effects on or relocation of residences?		X				

DIRECT and INDIRECT IMPACTS

No Action: Alternative 1

Under this alternative there would be no temporary increase in presence of government personnel in the Lee Metcalf Wilderness Area. There would be no short-term closures of wilderness or USFS service system trails under this alternative.

Proposed Action: Alternative 2

Comment 7b: The Lee Metcalf Wilderness is part of the 109 million acre National Wilderness Preservation System. This system of lands provides clean air, water, and habitat critical for rare and endangered plants and animals. Some of the proposed project area lies within the designated Lee Metcalf Wilderness Area. This project restores native WCT to critical habitat that already exists through removal of non-native fish. Wilderness Areas are congressionally designated and have specific mandates governing their management to maintain their wilderness qualities (e.g., no mechanized equipment, no roads, etc.). The pillars of wilderness include areas that are: natural, undeveloped, provide outstanding opportunities for solitude, primitiveness, and unconfined recreation, and/or have special features or values associated with them. The designation and management of wilderness areas are evaluated based upon these pillars. The restoration of WCT in North Fork Spanish Creek as proposed in this document would not affect the long-term natural state of the area and the area would be returned to a more native state with the return of the trout native to the stream. There would be temporary effects on aquatic invertebrates as a result of using rotenone to remove non-native trout (see comment 5c). However, it is expected that non target aquatic organisms would recover to pre-existing conditions within 1-3 years after the project is complete (see Comment 5c).

When the project objectives are achieved, the wilderness portion of North Fork Spanish Creek will return to a more natural state where only native fish species are present. There will be no development associated with the restoration of WCT to North Fork Spanish Creek. Backcountry horses would be used to access treatment areas, ferry gear, and move personnel. If necessary because of unforeseen circumstances, there would be short term and minor impacts to wilderness character through the potential use of mechanized equipment to access the drainage and transport personnel and equipment to the project site. There would be no long-term impacts on the solitude of the area or the primitiveness or opportunities for unconfined recreation, but there would be short-term impacts (1 - 2 days) if mechanized equipment is deemed necessary for project success. Temporary impacts to solitude would also be present when performing the fish removal because of increases in human presence - these impacts should be minimized because of the lack of public access during the treatment. Ten to 20 people would be present for 4-6 days in the Wilderness Area to complete the proposed restoration. The proposed project would not negatively affect any identified special features of the Lee Metcalf Wilderness Area; however it would create a special feature in the wilderness through the restoration of a native fish

community. There are no other streams in the Lee Metcalf Wilderness area that support a native assemblage of aquatic species.

It is unlikely that North Fork Spanish Creek will attract additional angling once restored to WCT. Other fisheries within the wilderness area, particularly in alpine lakes, attract some anglers. The increase in use at these lakes can lead to increasing human impacts. However, it is unlikely that anglers would specifically target North Fork Spanish Creek for angling due to its small size and the likely small size of the fish that will be present in the stream. It is anticipated that future angling at Chiquita and Big Brother lakes will be similar to current use.

Unlike outside wilderness areas where individual states maintain the authority to manage fish and wildlife populations, both state and federal agencies are responsible for "fostering mutual understanding and cooperation in the management of fish and wildlife in wilderness" (Bosworth 2006).

The use of a piscicide (rotenone) is proposed within the wilderness area to restore WCT to North Fork Spanish Creek. The agreement between the Association of Fish and Wildlife Agencies and management within wilderness areas states: "Chemical treatment may be necessary to prepare waters for the reestablishment of indigenous fish species**,** consistent with approved wilderness management plans**,** to conserve or recover Federally listed threatened or endangered species, or to correct undesirable conditions resulting from human activity. Proposals for chemical treatments would be considered and may be authorized by the Federal administering agency through application of the Minimum Requirements Decision Guide Process (Project File) as outlined in Section E., General Policy (see Appendix 1). Any use of chemical treatments in wilderness requires prior approval by the Federal administering agency." Precedents for similar cutthroat restoration projects within wilderness areas across Montana have been established (e.g., West Fork Mudd Creek and Pintler Creek (Anaconda-Pinter Wilderness), Cherry Lake (Lee Metcalf Wilderness), Goose Creek and Fourmile Creek (Absaroka-Beartooth Wilderness) among others). WCT is the only indigenous trout species to the Gallatin River drainage and North Fork Spanish Creek. Therefore, the use of rotenone in the wilderness to restore WCT to North Fork Spanish Creek would correct the undesirable condition created by past stocking of non-native fish and it is within established policy for wilderness management.

Comment 7c: During treatment with rotenone, public access to the project areas would be closed for several days to prevent public exposure to rotenone. The length of the closure would depend on the amount of time it takes to complete the treatment but would not exceed 7 days. High Lakes Trail would be closed between intersecting trails. Other trails that directly access North Fork Spanish Creek may also be closed. The label for CFT Legumine states that detoxification should be terminated when replenished fish survive and show no signs of stress for at least four hours. FWP expects the treated waters in North Fork Spanish Creek to be non-toxic to fish in 24-48 hours after the application of rotenone. Therefore, it can reasonably be expected that any closures would last less than 7 days. The treatment would be implemented in late summer (August). At proposed treatment levels, stream water would not be toxic to wildlife or livestock. However, to limit any potential conflict, the treatment would be coordinated such that livestock are pastured elsewhere during the treatment period.

CUMULATIVE IMPACTS

No Action: Alternative 1

Under this alternative, there would be no temporary reduction in access to the Lee Metcalf Wilderness area and the Custer-Gallatin National Forest.

Proposed Action: Alternative 2

Impacts on land use from the proposed action would be short term and minor. FWP does not expect the proposed action to result in other actions that would impact land use in the proposed WCT restoration streams. FWP does not foresee any other activities in the basin that would add to impacts of the proposed action. As such there are no cumulative impacts related to land use from the proposed treatment of the proposed stream and lakes with piscicides.

8. RISK/HEALTH HAZARDS Will the proposed action result in:	Impact Unknown	No Impact	Impact Minor	Impact Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Risk of an explosion or release of hazardous substances (including, but not limited to oil, pesticides, chemicals, or radiation) in the event of an accident or other forms of disruption?			X		Yes	8a
b. Affect an existing emergency response or emergency evacuation plan or create a need for a new plan?			X		Yes	8b
c. Creation of any human health hazard or potential hazard?			X		Yes	see 8a,c
d. Will any chemical toxicants be used?			X		Yes	see 8a

DIRECT and INDIRECT IMPACTS

No Action: Alternative 1

Under this alternative there would be no increased risk to human health from the use of piscicides.

Proposed Action: Alternative 2

Comment 8a: The principal risk of human exposure to hazardous materials from this project would be limited to the applicators of the rotenone. To limit exposure, all applicators would wear safety equipment required by the product label and MSDS sheets. Such safety equipment may include respirators, goggles, waders, Tyvek overalls, and Nitrile gloves. All applicators would be trained on the safe handling and application of the piscicide. At least one Montana Department of Agriculture certified pesticide applicator would supervise and administer the

project. A second independent applicator would verify that all label requirements and FWP Piscicide Policy is followed. Materials would be transported, handled, applied and stored according to the label specifications to reduce the probability of human exposure or spill. See also Comment 8c for other review of risks to general public.

Comment 8b: FWP requires a treatment plan for rotenone projects. This plan addresses many aspects of safety for people who are on the implementation team such as establishing a clear chain of command, training, delegation and assignment of responsibility, clear lines of communication between members, a spill contingency plan, first aid, emergency responder information, personal protective equipment, monitoring and quality control, among others. Implementing this project should not have any impact on existing emergency plans. Because an implementation plan has been developed by FWP the risk of emergency response is minimal and any affects to existing emergency responders would be short term and minor.

Comment 8c: The EPA (2007) conducted an analysis of the human health risks for rotenone and concluded it has a high acute toxicity for both oral and inhalation routes, but has a low acute toxicity for dermal route of exposure. It is not an eye or skin irritant nor a skin sensitizer. The EPA could not provide a quantitative assessment of potentially critical effects on neurotoxicity risks to rotenone users, so a number of uncertainty factors were assigned to the rating values. They are; an additional 10x database uncertainty factor - in addition to the inter-species (10x) uncertainty factor and intra-species (10x) uncertainty factor – has been applied to protect against potential human health effects and the target margin of exposure (MOE) is 1000. The following table summarizes the EPA toxicological endpoints of rotenone (from EPA 2007);

Exposure Scenario	**Dose Used in Risk Assessment, Uncertainty Factor (UF)**	**Level of Concern for Risk Assessment**	**Study and Toxicological Effects**
Acute Dietary (females 13-49)	NOAEL = 15 mg/kg/day UF = 1000 aRfD = 15 mg/kg/day = 0.015 mg/kg/day 1000	Acute PAD = 0.015 mg/kg/day	Developmental toxicity study in mouse (MRID 00141707, 00145049) LOAEL = 24 mg/kg/day based on increased resorptions
Acute Dietary (all populations)	An appropriate endpoint attributable to a single dose was not identified in the available studies, including the developmental toxicity studies.		
Chronic Dietary (all populations)	NOAEL = 0.375 mg/kg/day UF = 1000 cRfD = 0.375 mg/kg/day = 0.0004 mg/kg/day 1000	Chronic PAD = 0.0004 mg/kg/day	Chronic/oncogenicity study in rat (MRID 00156739, 41657101) LOAEL = 1.9 mg/kg/day based on decreased body weight and food consumption in both males and females
Incidental Oral Short-term (1-30 days) Intermediate-term (1-6 months)	NOAEL = 0.5 mg/kg/day	Residential MOE = 1000	Reproductive toxicity study in rat (MRID 00141408) LOAEL = 2.4/3.0 mg/kg/day [M/F] based on decreased parental (male and female) body

			weight and body weight gain
Dermal Short-, Intermediate-, and Long-Term	NOAEL = 0.5 mg/kg/day 10% dermal absorption factor	Residential MOE = 1000 Worker MOE = 1000	Reproductive toxicity study in rat (MRID 00141408) LOAEL = 2.4/3.0 mg/kg/day
Inhalation Short-term (1-30 days) Intermediate-term (1-6 months)	NOAEL = 0.5 mg/kg/day 100% inhalation absorption factor	Residential MOE = 1000 Worker MOE = 1000	[M/F] based on decreased parental (male and female) body weight and body weight gain
Cancer (oral, dermal, inhalation)	Classification; No evidence of carcinogenicity		

UF = uncertainty factor, NOAEL = no observed adverse effect level, LOAEL = lowest observed adverse effect level, aPAD = acute population adjusted dose, cPAD = chronic population adjusted does, RfD = reference dose, MOE = margin of exposure, NA = Not Applicable

Rotenolenoids are common degradation products found in the parent plant material used to make piscicidal forms of rotenone. The EPA (2007) concluded these degradation products are no more toxic than the active ingredient.

The EPA analysis of acute dietary risk for both food and drinking water concluded;

> *"…When rotenone is used in fish management applications, food exposure may occur when individuals catch and eat fish that either survived the treatment or were added to the water body (restocked) prior to complete degradation. Although exposure from this route is unlikely for the general U.S. population, some people might consume fish following a rotenone application. EPA used maximum residue values from a bioaccumulation study to estimate acute risk from consuming fish from treated water bodies. This estimate is considered conservative because the bioaccumulation study measured total residues in edible portions of fish including certain non-edible portions (skin, scales, and fins) where concentrations may be higher than edible portions (tissue) and the Agency assumed that 100% of fish consumption could come from rotenone exposed fish. In addition, fish are able to detect rotenone's presence in water and, when possible, attempt to avoid the chemical by moving from the treatment area. Thus, for partial kill uses, surviving fish are likely those that have intentionally minimized exposure.*
>
> *Acute exposure estimates for drinking water considered surface water only because rotenone is only applied directly to surface water and is not expected to reach groundwater. The estimated drinking water concentration (EDWC) used in dietary exposure estimates was 200 ppb, the solubility limit of rotenone. The drinking water risk assessment is conservative because it assumes water is consumed immediately after treatment with no degradation and no water treatment prior to consumption.*

Acute dietary exposure estimates result in dietary risk below the Agency's level of concern. Generally, EPA is concerned when risk estimates exceed 100% of the acute population adjusted dose (aPAD). The exposure for the "females 13-49 years old" subgroup (0.1117 mg/kg/day) utilized 74% of the aPAD (0.015 mg/kg/day) at the 95th percentile (see Table 5). It is appropriate to consider the 95th percentile because the analysis is deterministic and unrefined. Measures implemented as a result of this RED will further minimize potential dietary exposure (see Section IV)"

As for evaluating the human chronic risk from exposure to rotenone treated water, the EPA acknowledges the four principle reasons for concluding there is a low risk: first, the rapid natural degradation of rotenone, second, using active detoxification measures by applicators such as potassium permanganate, third, properly following piscicide labels and the extra precautions stated in this document and finally, proper signing, public notification or area closures which limit public exposure to rotenone treated water.

As for recreational exposure, the EPA concludes no risk to adults who enter treated water following the application by dermal and incidental ingestion, but requires a waiting period of 3 days after a treatment before toddlers swim in treated water. The aggregate risk to human health from food, water and swimming does not exceed the EPA level of concern (EPA 2007). Recreationists in the area would likely not be exposed to the treatments because treatment areas would be closed to public access. Signs would be in place to warn recreationists that the streams are being treated with rotenone and closed to entry. Proper warning through news releases, signing the project area, temporary road closure and administrative personnel in the project area should be adequate to keep recreationists from being exposed to any treated waters.

Fisher (2007) conducted an analysis of the inert constituent ingredients found in the rotenone formulation of CFT Legumine for the California Department of Fish and Game. These inert ingredients are principally found in the emulsifying agent Fennodefo^{99} which helps make the generally insoluble rotenone more soluble in water. The constituents were considered because of their known hazard status and not because of their concentrations in the Legumine formulation. Solvents such as xylene, trichloroethylene (TCE) and tetrachloroethylene are residue left over from the process of extracting rotenone from the root and can be found in some lots of Legumine. However, inconsistent detectability and low occurrence in other formulations that used the same extraction process were below the levels for human health and ecological risk. Solvents such as toluene, n-butylbenzene, 1,2,4 trimethylbenzene and naphthalene are present in Legumine, and when used in other applications can be an inhalation risk. However, because of their low concentrations in this formulation, the human health risk is low. The remaining constituents, the fatty acid esters, resin acids, glycols, substituted benzenes, and 1-hexanol were likewise present but either analyzed, calculated or estimated to be below the human health risk levels when used in a typical fish eradication project.

Methyl pyrrolidone is also found in Legumine. It is known to have good solvency properties and is used to dissolve a wide range of compounds including resins (rotenone). Analysis of Methyl pyrrolidone in Legumine showed it represents about 9% of the formulation (Fisher 2007). The analysis concluded regarding the constituent ingredients in Legumine;

"…None of the constituents identified are considered persistent in the environment nor will they bioaccumulate. The trace benzenes identified in the solvent mixture of CFT Legumine™ will exhibit limited volatility and will rapidly degrade through photolytic and biological degradation mechanisms. The PEGs are highly soluble, have very low volatility, and are rapidly biodegraded within a matter of days. The fatty acids in the fatty acid ester mixture (Fennodefo99™) do not exhibit significant volatility, are virtually insoluble, and are readily biodegraded, although likely over a slightly longer period of time than the PEGs in the mixture. None of the new compounds identified exhibit persistence or are known to bioaccumulate. Under conditions that would favor groundwater exchange the highly soluble PEGs could feasibly transmit to groundwater, but the concentrations in the reservoir, and the rapid biodegradation of these constituents makes this scenario extremely unlikely. Based upon a review of the physical chemistry of the chemicals identified, we conclude that they are rapidly biodegraded, hydrolyzed and/or otherwise photolytically oxidized and that the chemicals pose no additional risk to human health or ecological receptors from those identified in the earlier analysis. None of the constituents identified appear to be at concentrations that suggest human health risks through water, or ingestion exposure scenarios and no relevant regulatory criteria are exceeded in estimated exposure concentrations…"

The Legumine Material Safety Datasheet states "…when working with an undiluted product in a confined space, use a non-powered air purifying respirator…and… air-purifying respirators do not protect workers in oxygen-deficient atmospheres…" It is not likely that workers would be handling Legumine in an oxygen deficient space during normal use. However, to guard against this, proper ventilation and safety equipment would be used according to the label requirements.

In their description of how South American Indians prepare and apply *Timbó*, a rotenone parent plant, Teixeira, et al. (1984) reported that the Indians extensively handled the plants during a mastication process, and then swam in lagoons to distribute the plant pulp. No harmful effects were reported. It is important to note that the primitive method of applying rotenone from root does not involve a calculated target concentration, metering devices or involve human health risk precautions as those involved with fisheries management programs.

One study, in which rats were injected with rotenone for a period of weeks, reported finding lesions characteristic of Parkinson's disease (Betarbet et al. 2000). However, the relevance of the results to the use of rotenone as a piscicide have been challenged based upon the following dissimilarities between the experimental methodology used and fisheries related applications: (1) the continuous intravenous injection method used to treat the rats leads to "continuously high levels of the compound in the blood," unlike field applications where 1) the oral route is the most likely method of exposure, 2) a much lower dose is used and 3) potential exposure to rotenone is limited to usually only a matter of days because of the rapid breakdown of the rotenone following application. Further, dimethyl sulfoxide (DMSO) was used to enhance tissue penetration in the laboratory experiment (normal routes of exposure actually slow introduction of chemicals into the bloodstream), no such chemicals enhancing tissue penetration are present in the rotenone formulation proposed for use in this treatment. Similar studies (Marking 1988) have found no Parkinson-like results. Extensive research has demonstrated that rotenone does not cause birth defects (HRI 1982), gene mutations (Van Geothem et al. 1981; BRL 1982) or cancer (Marking 1988). Rotenone was found to have no direct role in fetal development of rats

that were fed high concentrations of rotenone. Spencer and Sing (1982) reported that rats that were fed diets laced with 10-1,000 ppm rotenone over a 10 day period did not suffer any reproductive dysfunction. Typical concentrations of actual rotenone used in fishery management range from 0.025 to 0.50 ppb (1 ppm product) and are far below that administered during most toxicology studies.

A recent study linked the use of rotenone and paraquat with the development of Parkinson's disease (PD) in humans later in life (Tanner et al. 2011). The after the fact study included mostly farmers from 2 states within the United States who presumably used rotenone for terrestrial application to crops and/or livestock. Rotenone is no longer approved for agricultural uses and is only approved for aquatic application as a piscicide. The results of epidemiological studies of pesticide exposure, such as this one have been highly variable (Guenther et al. 2011). Studies have found no correlations between pesticide exposure and PD (e.g., Jiménez-Jiménez 1992; Hertzman 1994; Engel et al. 2001; Firestone et al. 2010), some have found correlations between pesticide exposure and PD (e.g., Hubble et al. 1993; Lai et al. 2002; Tanner et al. 2011) and some have found it difficult to determine which pesticide or pesticide class is implicated if associations with PD occur (e.g., Engel et al. 2001; Tanner et al. 2009). Recently, epidemiological studies linking pesticide exposure to PD have been criticized due to the high variation among study results, generic categorization of pesticide exposure scenarios, questionnaire subjectivity, and the difficulty in evaluating the causal factors in the complex disease of PD, which may have multiple causal factors (age, genetics, environment) (Raffaele et al. 2011). A specific concern is the inability to assess the degree of exposure to certain chemicals, including rotenone, particularly the concentration of the chemical, frequency of use, application (e.g., agricultural, insect removal from pets), and exposure routes (Raffaele et al. 2011). No information is given in the Tanner et al. (2011) study about the formulation of rotenone used (powder or liquid) or the frequency or dose farmers were exposed to during their careers. There is also no information given about the personal protective equipment used or any information about other pesticides farmers were exposed to during the period of the study. It is also unclear in the Tanner et al. (2011) study the frequency and the dose individuals were exposed to during the time period of use. Without information on how much rotenone individuals were exposed to and for how long, it is difficult to evaluate the potential risk to humans of developing Parkinson's disease from aquatic applications of rotenone products.

The state of Arizona conducted an exhaustive review to the risks to human health of rotenone use as a piscicide (Guenther et al. 2011). They concluded: "To date, there are no published studies that conclusively link exposure to rotenone and the development of clinically diagnosed PD. Some correlation studies have found a higher incidence of PD with exposure to pesticides among other factors, and some have not. It is very important to note that in case-control correlation studies, causal relationships cannot be assumed and some associations identified in odds-ratio analyses may be chance associations. Only one study (Tanner et al. 2011) found an association between rotenone and paraquat use and PD in agricultural workers, primarily farmers. However, there are substantial differences between the methods of application, formulation, and doses of rotenone used in agriculture and residential settings compared with aquatic use as a piscicide, and the agricultural workers interviewed were also exposed to many other pesticides during their careers. Through the EPA re-registration process of rotenone, occupational exposure risk is minimized by: new requirements that state handlers may only apply rotenone at less than the maximum treatment concentrations (200 ppb), the development of engineering controls to some of the rotenone dispensing equipment, and requiring handlers to wear specific PPE."

It is clear that to reduce or eliminate the risk to human health, including any potential risk of developing Parkinson's disease, public exposure to rotenone treated water must be eliminated to the extent possible. To reduce the potential for exposure of the public during the proposed use of CFT Legumine to restore WCT, areas treated with rotenone would be closed to public access during the treatment. Signs would be placed at access points informing the public of the closure and the presence of rotenone treated waters. Personnel would be onsite to inform the public and escort them from the treatment area should they enter. Rotenone treated waters would be limited to the proposed treatment areas by adding potassium permanganate to the stream at the downstream end of the treatment reach (fish barrier). Potassium permanganate would neutralize any remaining rotenone before leaving the project area. The efficacy of the neutralization would be monitored using fish (the most sensitive species to the chemical) and a hand held colorimeter. Therefore, the potential for public exposure to rotenone treated waters is very minimal. The potential for exposure would be greatest for those government workers applying the chemical. To reduce their exposure, all CFT Legumine label mandates for personal protective equipment would be adhered to (see Comment 8a).

CUMULATIVE IMPACTS

No Action: Alternative 1

Under this alternative there would be no cumulative impacts to human health. All activities other than the proposed action; whether private, corporate, or governmental have innate human health risks.

Proposed Action: Alternative 2

Health hazards from the proposed action would be short term and mitigated through closure of treatment areas to public and use of proper safety equipment, etc. Because rotenone in all formulations including CFT Legumine breaks down quickly and does not bioaccumulate, there should be no long-term or cumulative impacts of the application of the piscicide. FWP does not expect the proposed action to result in other actions that would increase the risk of health hazards in the streams proposed for WCT restoration. FWP does not foresee any other activities in the basin that would add to health impacts of the proposed action. As such there are no cumulative impacts related health hazards from the proposed treatment.

9. COMMUNITY IMPACT Will the proposed action result in:	Impact Unknown	No Impact	Impact Minor	Impact Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Alteration of the location, distribution, density, or growth rate of the human population of an area?		X				
b. Alteration of the social structure of a community?		X				

c. Alteration of the level or distribution of employment or community or personal income?		X				
d. Changes in industrial or commercial activity?		X				
e. Increased traffic hazards or effects on existing transportation facilities or patterns of movement of people and goods?		X				

DIRECT and INDIRECT IMPACTS

No Action: Alternative 1

Under this alternative there would be no impacts to communities nearby or reliant on national forest land or the Lee Metcalf Wilderness Area.

Proposed Action: Alternative 2

Under this alternative there would be a short period of time during piscicide treatment that access to North Fork Spanish Creek, Chiquita and Big brother lakes would be inaccessible (no more than two weeks). Additionally, North Fork Spanish Creek, Chiquita and Big Brother lakes would be fishless for 2-3 years post treatment with piscicides. Mitigation for lost fishing, if an issue with guides or outfitters, could be alleviated by stocking of sterile fish in Big Brother lake.

CUMULATIVE IMPACTS

No Action: Alternative 1
Under this alternative there would be no cumulative impacts to the community from construction of a fish barrier or treatment of the project area with piscicides.

Proposed Action: Alternative 2

Under this alternative there would be no cumulative impacts to the surrounding community from construction of a fish barrier or treatment of the project area with piscicides.

10. PUBLIC SERVICES/TAXES/UTILITIES Will the proposed action result in:	Impact Unknown	No Impact	Impact Minor	Impact Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Will the proposed action have an effect upon or result in a need for new or altered governmental services in any of the		X				

following areas: fire or police protection, schools, parks/recreational facilities, roads or other public maintenance, water supply, sewer or septic systems, solid waste disposal, health, or other governmental services? If any, specify: _____						
b. Will the proposed action have an effect upon the local or state tax base and revenues?		X				
c. Will the proposed action result in a need for new facilities or substantial alterations of any of the following utilities: electric power, natural gas, other fuel supply or distribution systems, or communications?		X				
d. Will the proposed action result in increased used of any energy source?		X				
e. Define projected revenue sources		X				
f. Define projected maintenance costs		X				

DIRECT and INDIRECT IMPACTS

No Action: Alternative 1

No Impacts

Proposed Action: Alternative 2

No Impacts

CUMULATIVE IMPACTS

No Action: Alternative 1

No Impacts

Proposed Action: Alternative 2

No Impacts

11. AESTHETICS/RECREATION Will the proposed action result in:	Impact Unknown	No Impact	Impact Minor	Impact Potentially Significant	Can Impact Be Mitigated	Comment Index

a. Alteration of any scenic vista or creation of an aesthetically offensive site or effect that is open to public view?		X				
b. Alteration of the aesthetic character of a community or neighborhood?		X				
c. Alteration of the quality or quantity of recreational/tourism opportunities and settings? (Attach Tourism Report)			X			11c
d. Will any designated or proposed wild or scenic rivers, trails or wilderness areas be impacted? (Also see 11a, 11c)			X			See 11c
e. impacts to wilderness character?			X			11e

DIRECT and INDIRECT IMPACTS

No Action: Alternative 1

Comment 11e: The following is a short summary of the potential impacts to wilderness character disclosed in the Minimum Requirements Decision Guide Workbook. The MRDG is included in the project file. The MRDG discloses the effects of 11 activity components for each of the six qualities of wilderness character. The 11 activity components include: 1) personnel access; 2) temporary project signing and flagging; 3) equipment transportation via pack stock; 4) camping; 5) preparatory work; 6) lake treatment; 7) stream treatment; 8) treatment effectiveness; 9) restocking; 10) restocking monitoring; and, 10) Communications. The wilderness character components include 1) untrammeled; 2) undeveloped; 3) natural; 4) solitude or primitive and unconfined recreation; 5) other features of value; and, 6) traditional skills.

Under the no-action alternative, the presence of hybrids and nonnative Brook Trout presents a long-term negative impact on wilderness character as this assemblage does not reflect the historic fishery that evolved in this setting and diminishes the biological integrity of the sub-watershed. No removal of hybrids and Brook Trout would allow this negative impacts to persist.

Untrammeled

The no action alternative would have no impact on the untrammeled quality of wilderness character.

Undeveloped

The no action alternative would have no impact on the undeveloped quality of wilderness character.

Natural

Through the no action alternative, indigenous species, patterns, and processes would not be protected and natural conditions would not be preserved. This altered fish assemblage would

continue to result in degradation to the natural quality of wilderness character. WCT would not recover without human intervention.

Solitude or Primitive and Unconfined Recreation

No action would have no impact on the solitude and unconfined recreation quality of wilderness character.

Other Features of Value

The no action alternative would not meet the project purpose and need resulting in the long-term conservation of WCT both locally and range-wide by providing refugia in light of climate change and future non-native invasion.

Proposed Action: Alternative 2

Comment 11c: Trails accessing North Fork Spanish Creek would be closed during the application of rotenone (<7 days). Other routes to and from North Fork Spanish Creek are on private land where access is restricted. Similar trail systems are present in nearby drainages that access the Lee Metcalf Wilderness Area. These trails would be unaffected by the proposed action. The timing of the project in late summer/early fall should avoid the busiest times of year on the trail system and avoid any conflicts with hunters and/or outfitters in the drainage.

There would be a temporary loss of angling opportunity in North Fork Spanish Creek, Chiquita and Big Brother lakes between the time of fish removal and for several years after until introduced fish grow to catchable size. Seventy-five percent of the proposed North Fork Spanish Creek project is on accessible wilderness or national forest land. However, all the tributaries that form North Fork Spanish Creek are small and receive little angling pressure. Further, there are adjacent streams and areas downstream of the proposed fish barrier that would provide similar angling alternatives. Similar projects in Montana have shown that North Fork Spanish Creek should be fully colonized with WCT within 5 years of project implementation and should provide the same angling opportunity to catch wild trout as pretreatment. The current regulations allow harvest of one WCT in the Central District of Montana. Chiquita and Big Brother lakes may receive fishing pressure higher than North Fork Spanish Creek. Moreover, the current regulations in the Central District allow harvest of five cutthroat per day in lakes and reservoirs. Harvest levels in Chiquita and Big Brother lakes is very low and likely would not require changes in regulations to reduce harvest. However, should harvest be unsustainable for newly developing WCT populations, regulations could be temporarily modified to protect these populations. As mitigation; and if use warrants, sterile WCT could be stocked for a time period to maintain the lake fisheries.

Comment 11e: The proposed action would result in activity in the Spanish Peaks Unit of the Lee Metcalf (LM) Wilderness Area. The LM Wilderness is managed to maintain "wilderness character," including opportunities for solitude or a primitive and unconfined type of recreation, making "the imprint of man's work less noticeable," protecting indigenous species, and allowing

natural processes to regulate ecosystems. Modern civilization and human control that affect ecological systems and processes can compromise wilderness character.

Disturbance associated with the proposed action would include short-term presence of humans, horses, camping, and the removal of the existing fishery using CFT Legumine. Following U.S. Forest Service camping specifications and food storage order restrictions would mitigate for the effects of camping and presence of horses.

Meeting the project objective of removing nonnative Brook Trout and hybrids would require complete removal of all fish within the project area with the exception of Placer Creek, including fish-bearing waterbodies within designated wilderness. Approximately 6.5 miles of fish bearing stream flow through and 8.4 lake acres lie within the Lee Metcalf Wilderness and would be treated with CFT Legumine. An additional 10 miles of stream outside the Lee Metcalf wilderness area would also be treated. (Table 4).

Table 4. Summary of lake acres and stream miles proposed for rotenone treatment both inside and outside the Lee Metcalf Wilderness Area. Acreages and miles are approximations based on GIS data and would be refined via field reconnaissance.

Waterbodies	Lake Acres		Stream Miles	
	Inside	Outside	Inside	Outside
N Fk Spanish Cr	-	-	3.50	4.20
Willow Swamp Cr	-	-	-	4.00
Placer Cr	-	-	-	0.25
Camp Cr	-	-	2.00	1.60
Alder Cr	-	-	1.00	-
Chiquita Lake	3.40	-	-	-
Big Brother Lake	5.00	-	-	-
TOTAL	8.40	-	6.50	10.05

During the Minimal Requirements Decision Guide analysis process described above under Direct and Indirect Impacts, two sets of tools were an analyzed against the no action alternative: "Proposed" and "Contingency ." This process looked at the minimal tools necessary to successfully achieve the purpose and need of Alternative 2. If Alternative 2 is authorized, crews would initially implement the "Proposed" set of tools before moving onto the "Contingency" set of tools. If it is deemed necessary to move on to the more mechanized set of tools, agencies proponents would meet with the Lee Metcalf Wilderness Coordinating Committee to discuss logistics. The option to move to the "Contingency" set of tools could occur without revisiting the EA or the MRDG. The impacts to wilderness character are summarized below are for the "Contingency" set of tools. The "Contingency" set of tools is the same as the "Proposed" set of tools plus the use of low elevation non-landing helicopter flights and an electric or combustible gas motor.

Untrammeled

Alternative 2, the proposed action, would have:

- Short-term negative impacts on the lake zooplankton and stream invertebrate populations. Research has shown that these populations recover quickly when label direction is followed.

- Long-term positive beneficial impacts in that native WCT would be returned to over 15 miles of stream habitat once historically occupied. This project would nearly double the number of stream miles occupied by WCT in the Gallatin River sub-basin. Non-native trout would be restocked in both headwater lakes and a couple miles of headwater streams thought to be historically fishless. Although not native in the extreme headwaters, replacing the existing non-native trout population with WCT is a step in the right direction to improving wilderness character.

Undeveloped

Alternative 2, the proposed action, would have:

- Long-term minimal negative impacts on visuals because a few dead and downed trees would have to be cut out to get pack stock safely in to Chiquita Lake along the existing user built trail. Mitigation to minimize impacts to the undeveloped quality would include the using primitive tools to cut these trees, placement trees back across the user built trail upon project completion, and by disguising fresh saw cuts by rubbing dirt across them.

- Long-term beneficial impacts to the undeveloped quality in that native WCT would be returned to over 15 miles of stream habitat once historically occupied (See Untrammeled).

Natural

Alternative 2, the proposed action, would have long-term beneficial impacts by improving the naturalness of the treatment area by restoring native WCT to over 15 miles of stream habitat which was the natural state of these waters. (See Untrammeled).

Solitude or Primitive and Unconfined Recreation

Alternative 2, the proposed action, would have:

- Short-term negative impacts from several component activities on solitude. Apart from Big Brother Lake, most of the project area is lightly visited with the exception of big game hunting season.

- Short-term negative impacts on solitude from up to twelve low elevation non-landing helicopter flights for equipment transportation and restocking.

- Short-term negative impacts on solitude as a result of using an electric or combustible gas motor.

Other Features of Value

Alternative 2, the proposed action, would have long-term beneficial impacts on the conservation of WCT both locally and range-wide by providing refugia in light of climate change and future non-native invasion.

Traditional Skills

Traditional pack stock and hand tools would be used where possible. "Proposed "alternative would allow for the use of small mechanically operated equipment including an injector pump.

Summary of the Effects of the Proposed Action on Wilderness

Fish removal using the piscicide is the only effective, practical alternative for meeting the project purpose and need of completely removing non-native trout with the least amount of negative impacts to wilderness character. Completing this project for the conservation of WCT improves the natural quality of wilderness character in the long-term and would return these streams to their historic state. Piscicide treatment also meets the objectives for fish and wildlife management in FSM 2323.3 by helping to conserve a native species that has a potential for future listing under ESA. The short-term negative impacts to wilderness character relating to the application of a piscicide are well balanced with the long-term improvements to natural conditions through the restoration of a native species.

CUMULATIVE IMPACTS

No Action: Alternative 1

Under this alternative aesthetics and recreation would be unchanged, as such, with no other projects planned for WCT restoration in the immediate area, there would be no cumulative impacts.

Proposed Action: Alternative 2

Impacts to recreation and aesthetics from the proposed action would be short term and minor. FWP does not expect the proposed action to result in other actions that would impact recreation/aesthetics in the stream proposed for WCT restoration. FWP does not foresee any other activities in the basin that would add to impacts of the proposed action. As such there are no cumulative impacts to recreation/aesthetics from the proposed action.

12. HISTORICAL RESOURCES Will the proposed action result in:	Impact Unknown	No Impact	Impact Minor	Impact Potentially Significant	Can Impact Be Mitigated	Comment Index

a. Destruction or alteration of any site, structure or object of prehistoric, historic, or paleontological importance?		X				
b. Physical change that would affect unique cultural values?		X				
c. Effects on existing religious or sacred uses of a site or area?		X				
d. Will the project affect historic or cultural resources?		X				

DIRECT and INDIRECT IMPACTS

No Action: Alternative 1

No Impacts

Proposed Action: Alternative 2

No Impacts

CUMULATIVE IMPACTS

No Action: Alternative 1

No Impacts

Proposed Action: Alternative 2

No Impacts

13. SUMMARY EVALUATION OF SIGNIFICANCE Will the proposed action, considered as a whole:	Impact Unknown	No Impact	Impact Minor	Impact Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Have impacts that are individually limited, but cumulatively considerable? (A project or program may result in impacts on two or more separate resources which create a significant effect when considered together or in total.)		X				
b. Involve potential risks or adverse effects which are uncertain but extremely hazardous if they were to occur?		X				

c. Potentially conflict with the substantive requirements of any local, state, or federal law, regulation, standard or formal plan?		X				
d. Establish a precedent or likelihood that future actions with significant environmental impacts will be proposed?		X				
e. Generate substantial debate or controversy about the nature of the impacts that would be created?			X		Yes	13e
f. Is the project expected to have organized opposition or generate substantial public controversy? (Also, see 13e)			X			13f
g. List any federal or state permits required.						13g

Comments 13e and f: The use of piscicide can generate controversy. Public outreach and information programs can inform the public on the use of pesticides. It is not known if this project would have organized opposition. Similar projects proposed and implemented in have had limited opposition, but they also had substantial support.

Comment 13g: The following permits for piscicide application would be required:

MDEQ Pesticide General Permit NDPES Discharge Permit for application of CFT Legumine.

USDA Forest Service Pesticide Use Authorization Form

PART IV. OVERLAPPING AGENCY JURISDICTION

Name of Agency and Responsibility

- Montana Department of Environmental Quality – NDPES Discharge Permit for application of CFT Legumine, 318 Permit for temporary increase in turbidity during barrier construction.
- US Forest Service, Custer Gallatin National Forest – authorization of the pesticides and motorized/mechanized equipment (if needed) within the Lee Metcalf Wilderness Area and temporary trail and area closures during the various treatments.
- Army Corps of Engineers – 404 Permit for placement of fill in wetlands.
- Department of Natural Resources and Conservation – 310 Permit for construction of fish barrier (Gallatin Conservation District).

PART V. AGENCIES THAT HAVE CONTRIBUTED OR BEEN CONTACTED

Montana Department of Environmental Quality
Montana Department of Fish, Wildlife & Parks

US Army Corps of Engineers
Montana Natural Heritage Program
Montana State Historic Preservation Office
US Forest Service, Custer Gallatin National Forest, Bozeman Ranger District

PART VI. ENVIRONMENTAL IMPACT STATEMENT REQUIRED?

After considering the potential impacts of the proposed action and possible mitigation measures, FWP has determined that an Environmental Impact Statement is not warranted. The impacts of WCT restoration as described in this document are minor and/or temporary and mitigation for many of the impacts is possible. The primary negative impacts as a result of this project are temporary impacts to the Lee Metcalf Wilderness character through the possible use of mechanized equipment, temporary reductions in aquatic invertebrate abundance as a result of toxic effects of rotenone, increased personnel presence during application of rotenone, and short term closures of the project stream and associated trails. Loss of access to this portion of the Lee Metcalf Wilderness Area would affect the public for less than one week. Other similar areas of the Lee Metcalf Wilderness would not be closed. Impacts to aquatic invertebrates have been shown to be short term with rapid recovery of stream biomass. Invertebrate assemblages would return to pre-treatment levels in approximately one year or less. Mitigation measures such as not treating sections of stream that do not contain fish but do contain aquatic invertebrates should reduce these impacts. Further, the benefit to native WCT, a species in need of conservation, would balance the potential short term negative impacts to other species.

PART VII. PUBLIC PARTICIPATION

Public Involvement

Public scoping:

- Public scoping notices were mailed to adjacent landowners and interested parties;
- Public scoping notices were posted on the FWP webpage (*http://fwp.mt.gov*) and the Custer Gallatin National Forest webpage (Schedule of Proposed Actions) from Spring 2016 to Summer 2017 – and,
- In person meeting with one of the scoping respondents to address their concerns and issues.

Public notification of the EA release and opportunities will be through the following media:

- Legal Notice posted in the *Bozeman Daily Chronicle;*
- Notification letters sent out to all responding to the initial scoping letter;
- Public notification via MFWP's webpage (*http://fwp.mt.gov*) and the Custer Gallatin National Forest webpage (http://www.fs.usda.gov/projects/custergallatin/landmanagement/projects).

Copies of this EA will be available for public review at FWP Region 3 Headquarters at

1400 South 19th Avenue, Bozeman, MT 59718

Public Comment Period

The public comment period will extend from 30 days beginning April 25, 2017 and ending May 25, 2017. Send comments to:

Montana Fish, Wildlife & Parks
c/o North Fork Spanish Creek WCT Restoration
1400 South 19th Avenue
Bozeman, MT 59718

Or via email to: davemoser@mt.gov

If you choose to submit comments regarding the Forest Service's portion of the project, please note the following:

Written comments shall include your name, address, and (if possible) telephone number; title of the document on which you are commenting; and specific facts or comments along with supporting reasons that you believe the Responsible Official should consider in reaching a decision.

Individuals and entities (non-governmental organizations, businesses, partnerships, state and local governments, Alaska Native Corporations, and Indian Tribes) who have submitted timely, specific written comments regarding a proposed project or activity during any designated opportunity for public comment may file an objection. Opportunity for public comment on an Environmental Assessment includes: during scoping, the 30-day public review above or any other instance where the responsible official seeks written comments.

Written comments are those submitted to the responsible official or designee during a designated opportunity for public participation provided for a proposed project. In order to have standing to file an Objection, specific written comments should be within the scope of the proposed action, have a direct relationship to the proposed action, and must include supporting reasons for the responsible official to consider.

Comments received through the U.S. Postal Service must be postmarked no later than the end of the 30-day comment period. All other comments, including e-mail, fax, and personal delivery must be received by COB (4:30 p.m.) at the at the above address by the end of the 30-day comment period. It is the responsibility of all individuals and organizations to ensure their comments are received in a timely manner.

Additionally, pursuant to 7 CFR 1.27(d), any person may request the agency to withhold a submission from the public record by showing how the Freedom of Information Act (FOIA) permits such confidentiality. Persons requesting such confidentiality should be aware that, under the FOIA, confidentiality may be granted in only very limited circumstances, such as to protect trade secrets. The Forest Service will inform the requester of the agency's decision regarding the

request for confidentiality and, where the request is denied, the agency will return the submission and notify the requester that the comments may be resubmitted with or without names and addresses."

Prepared by: David Moser, Fisheries Biologist
Submit written comments to:

Montana Fish, Wildlife & Parks
c/o North Fork Spanish Creek WCT Restoration
1400 South 19th Avenue
Bozeman, MT 59718

Or via email to: davemoser@mt.gov

Comment period is 30 days. Comments must be received by May 25, 2017.

PART VII. REFERENCES

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